All About

Servicing

OVER THE RANGE MICROWAVE OVENS

With Electronic Controls

FRIGIDAIRE™

White-Westinghouse

Gibson

Kelvinator

TAPPAN

Electrolux Major Appliances; North America
250 Bobby Jones Expwy
Augusta, GA 30907

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Safe Servicing Practices

Avoid personal injury and/or property damage by observing important Safe Servicing Practices. Following are some limited examples of safe practices:

1. DO NOT attempt a product repair if you have any doubts as to your ability to complete the repair in a safe and satisfactory manner.

2. Always Use The Correct Replacement Parts as indicated in the parts documentation. Substitutions may defeat compliance with Safety Standards Set For Home Appliances. Do not exceed maximum recommended wattage on light bulb replacements. Doing so could blow fuses and/or damage transformers.

3. Before servicing or moving an appliance:
   - Remove power cord from the electrical outlet, trip circuit breaker to the OFF position, or remove fuse.

4. Never interfere with the proper operation of any safety device.

5. Use ONLY REPLACEMENT PARTS CATALOGED FOR THIS APPLIANCE. Substitutions may defeat compliance with Safety Standards Set For Home Appliances.

6. GROUNDING: The standard color coding for safety ground wires is GREEN, or GREEN with YELLOW STRIPES. Ground leads are not to be used as current carrying conductors. It is EXTREMELY important that the service technician reestablish all safety grounds prior to completion of service. Failure to do so will create a hazard.

7. Prior to returning the product to service, ensure that:
   - All electrical connections are correct and secure.
   - All electrical leads are properly dressed and secured away from sharp edges, high-temperature components, and moving parts.
   - All non-insulated electrical terminals, connectors, heaters, etc. are adequately spaced away from all metal parts and panels.
   - All safety grounds (both internal and external) are correctly and securely connected.
   - All panels are properly and securely reassembled.

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Section 1 Basic Information

This Manual has been prepared to provide Electrolux Service Personnel with Operation and Service Information for Frigidaire Microwave Ovens FGMV154CLF , FGMV154CL(B,W), CGMV154CLF and CGMV154CL(B,W).

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⚠ WARNING

Certain initial parts are intentionally not grounded and present a risk of electrical shock only during servicing. Service personnel - do not contact the following parts while the appliance is energized:

Inverter unit, that includes high voltage capacitor, high voltage power transformer, high voltage rectifier, heat sink, etc., magnetron, high voltage harness etc.; If provided, fan assembly, cooling fan motor.

All the parts marked "*" on parts list are used at voltages more than 250v.

Removal of the outer wrapper gives access to voltage above 250v.

All the parts marked "△" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

⚠ WARNING

This service manual is intended for use by persons having electrical and mechanical training and a level of knowledge of these subjects generally considered acceptable in the appliance repair trade. Electrolux home products cannot be responsible, nor assume any liability, for injury or damage of any kind arising from the use of this manual.

⚠ WARNING

Never operate the oven until the following points are ensured.

(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is no other visible damage with the oven.

Servicing and repair work must be carried out only by trained service personnel.

Precautions To Be Observed Before And During Servicing To Avoid Possible Exposure To Excessive Microwave Energy

1. Do not operate or allow the oven to be operated with the door open.
2. Make the following safety checks on all ovens to be serviced before activating the magnetron or other micro wave source, and make repairs as necessary: (1) interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.
3. Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.
4. Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
5. A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

Before Servicing

Before servicing an operative unit, perform a microwave emission check as per the Microwave Measurement Procedure outlined in this service manual.

If microwave emissions level is in excess of the specified limit, contact ELECTROLUX HOME PRODUCTS, INC. immediately.

If the unit operates with the door open, service person should:

1. Tell the user not to operate the oven.
2. Contact Electrolux HOME PRODUCTS, INC. and Food and Drug Administration's Center for Devices and Radiological Health immediately.

Service personnel should inform ELECTROLUX HOME PRODUCTS, INC. of any certified unit found with emissions in excess of 4mW/cm2. The owner of the unit should be instructed not to use the unit until the oven has been brought into compliance.

Danger High Voltage

Do not energize a microwave oven with the outer case cabinet removed, because a microwave oven generates high voltage in the circuit.

If you intend to operate the oven employing the high frequency switching power converter circuit, you should take special precautions to avoid an electrical shock hazard.

The high voltage transformer, high voltage capacitor and high voltage diode have energized high voltage potential of approximately 8KV.

The aluminium heat sink is connected to the switching power transistor collector pole, and has an energized high voltage potential of approximately 650V peak.

DO NOT ACCESS THE HIGH VOLTAGE TRANSFORMER, HIGH VOLTAGE CAPACITOR, HIGH VOLTAGE DIODE AND HEAT SINK WHEN THE POWER SUPPLY IS CONNECTED TO AN ELECTRICAL OUTLET.

WARNING

Microwave ovens contain circuitry capable of producing very high voltage and current. Contact with the following parts may result in a severe, possibly fatal, electrical shock.

Inverter unit, that includes High Voltage Capacitor, High Voltage Power Transformer, High Voltage Rectifier, Heat sink etc., and Magnetron, High Voltage Harness etc.. Read the Service Manual carefully and follow all instructions.

Before Servicing

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Whenever troubleshooting is performed, the power supply must be disconnected. It may, in some cases, be necessary to connect the power supply after the outer case has been removed, in this event:

1. Disconnect the oven power supply cord and then remove the outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect leads to the primary of the inverter unit.
5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, reconnect the power supply cord.

When Testing Is Completed

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Reconnect leads to the primary of the inverter unit.
5. Reinstall the outer case (cabinet).
6. Reconnect the power supply cord after the outer case is installed.
7. Run the oven and check all functions.

After repairing

1. Reconnect all leads removed from components during testing.
2. Reinstall the outer case (cabinet).
3. Reconnect the power supply cord after the outer case is installed.
4. Run the oven and check all functions. Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and then set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out Before Servicing procedure and re-examine the connections to the component being tested.

Microwave Measurement Procedure (USA)

A. Requirements:

1) Microwave leakage limit (Power density limit): The power density of microwave radiation emitted by a microwave oven should not exceed 1 mW/cm^2 at any point 5 cm or more from the external surface of the oven, measured prior to acquisition by a purchaser, and thereafter (through the useful life of the oven), 5 mW/cm^2 at any point 5 cm or more from the external surface of the oven.
2) Safety interlock switches: Primary interlock switch shall prevent microwave radiation emission in excess of the requirement as above mentioned, secondary interlock switch shall prevent microwave radiation emission in excess of 5 mW/cm^2 at any point 5 cm or more from the external surface of the oven.

B. Preparation for testing:

Before beginning the actual measurement of leakage, proceed as follows:

1) Make sure that the actual instrument is operating normally as specified in its instruction booklet.
   Important:
   Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 21 CFR 1030.10(c)(3)(i), must be used for testing.
2) Place the oven tray in the oven cavity.
3) Place the load of 275±15 ml (9.8 oz) of tap water initially at 20°±5°C (68°F) in the center of the oven cavity. The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically nonconductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4) Set the cooking control on Full Power Cooking Mode.
5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

C. Leakage test:

Closed-door leakage test (microwave measurement)

1) Grasp the probe of the survey instrument and hold it perpendicular to the gap between the door and the body of the oven.
2) Move the probe slowly, not faster than 1 in./sec. (2.5 cm/sec.) along the gap, watching for the maximum indication on the meter.
3) Check for leakage at the door screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents). While testing for leakage around the door pull the door away from the front of the oven as far as is permitted by the closed latch assembly.
4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4 mW/cm^2, and that the primary interlock switch and secondary interlock switch do turn the oven OFF before any door movement.

NOTE: After servicing, record data on service invoice and microwave leakage report.

Microwave Measurement Procedure (Canada)

After adjustment of the door switches are completed individually or collectively, switch test and microwave leakage test must be performed with survey instrument and test result must be confirmed to meet the requirement of the performance standard for microwave ovens as under mentioned.

A. Requirements:

Every microwave oven shall function in such a manner that when the oven is fully assembled and operating with its service controls and user controls adjusted to yield the maximum output, the leakage radiation, at all points at least 5 cm. from the external surface of the oven, does not exceed:

1) 1.0 mW/cm^2 with the test load of 275 ± 15 ml of water at an initial temperature 20 ±5°C.
2) 5.0 mW/cm^2 when the outer enclosure is removed with a test load of 275 ± 15 ml of water at an initial temperature 20±5°C.
3) 5.0 mW/cm^2 without a test load.

B. Preparation for testing:

Before beginning the actual measurement of leakage, proceed as follows:

1) Make sure that the actual instrument is operating normally as specified in its instruction booklet. Survey instruments that comply with the requirement for instrumentation as prescribed by CSA and NHW performance standard for microwave ovens must be used for testing recommended instruments are, NARDA 8100 and NARDA 8200.
2) Place the oven tray in the oven cavity.
3) Place the load of 275±15 ml (9.8 oz) of tap water initially at 20°±5°C (68°F) in the center of oven cavity. The water container shall be a low form of a 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically nonconductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4) Set the cooking control on Full Power Cooking Mode.
5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

C. Leakage test with enclosure installed:

1) Grasp probe of survey instrument and hold it perpendicular to gap between door and the body of the oven.
2) Move the probe slowly, not faster than 2.5 cm/sec. along the gap, watching for maximum indication on meter.
3) Check for leakage at the door screen, sheet metal seams and other accessible positions where continuity of the metal has been breached (eg., around the switches, indicator, and vents). While testing for leakage around door, pull door away from the front of the oven as far as is permitted by the closed latch assembly.
4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4 mW/cm^2, and that the primary interlock switch and secondary interlock switch do turn the oven OFF before any door movement.

D. Leakage test without enclosure:

1) Remove the enclosure (cabinet).
2) Grasp the probe of the survey instrument and hold it perpendicular to all mechanical and electric parts of the oven that is accessible to the user of the oven including, but not limited to, the waveguide, cavity seams, magnetron gap between the door and the body of the oven.
3) Move probe slowly, not faster than 2.5 cm/sec. along the gap, watching for the maximum indication on meter.
4) Measure carefully at the point of highest leakage and make sure that the highest leakage is under 5 mW/cm^2.

CAUTION: Special attention should be given to avoid electrical shock because HIGH VOLTAGE is generated during this test.

E. No Load test

1) Operate the oven without a load and measure the leakage by the same method as the above test procedure " Leakage test with enclosure installed"
2) Make sure that the highest leakage should not exceed 5 mW/cm^2.

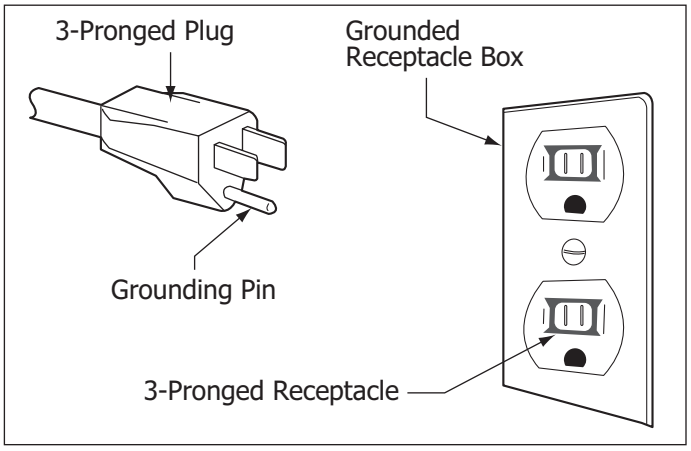
NOTE: After servicing, record data on service invoice and microwave leakage report.

Product Specification

Item	Description
Power Requirements	(USA)120 Volts / 13.5 Amperes, 1500 Watts 60 Hertz Single phase, 3 wire grounded
Power Output	900 watts (IEC 705 Test Procedure) Operating frequency of 2450MHz
Case Dimensions (excluding handle)	Width 29.88″ Height 15.75″ Depth 15.04″
Cooking Cavity Dimensions (1.8 Cubic Feet)	Width 20.20″ Height 8.94″ Depth 13.94″
Hood Lamp	2 bulbs, 30W x 2, Incandescent light bulbs
Hood fan	Approx. 300 C.F. (High mode)
Control Complement	Touch Control System Clock (1:00 - 12:59) Timer (0 - 99 min. 99 seconds) Microwave Power for Variable Cooking Repetition Rate; P-HI Full power throughout the cooking time P-90 approx. 90% of Full Power P-80 approx. 80% of Full Power P-70 approx. 70% of Full Power P-60 approx. 60% of Full Power P-50 approx. 50% of Full Power P-40 approx. 40% of Full Power P-30 approx. 30% of Full Power P-20 approx. 20% of Full Power P-10 approx. 10% of Full Power P-0 No power throughout the cooking time Popcorn pad, Reheat pad, Cook pad, Defrost pad, Number selection pads Power Level pad, Timer / Clock pad, Light button, Fan button, Clear/Off button, START/ Plus 1 Min button,
Oven Cavity Light	30 Watt Incandescent light bulb
Safety Standard	UL Listed FCC Authorized DHHS Rules, CFR, Title 21, Chapter 1, Subchapter J Canadian Standards Association Health CANADA, Industry Canada
Weight	Approx. 69.45lbs

Grounding Instructions

This oven is equipped with a three prong grounding plug. It must be plugged into a wall receptacle that is properly installed and grounded in accordance with the National Electrical Code, local codes and ordinances. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current.

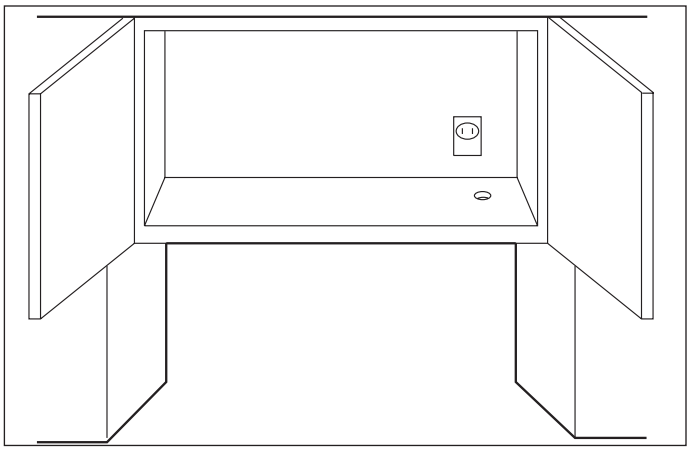


WARNING

Improper use of the grounding plug can result in a risk of electric shock.

Electrical Requirements

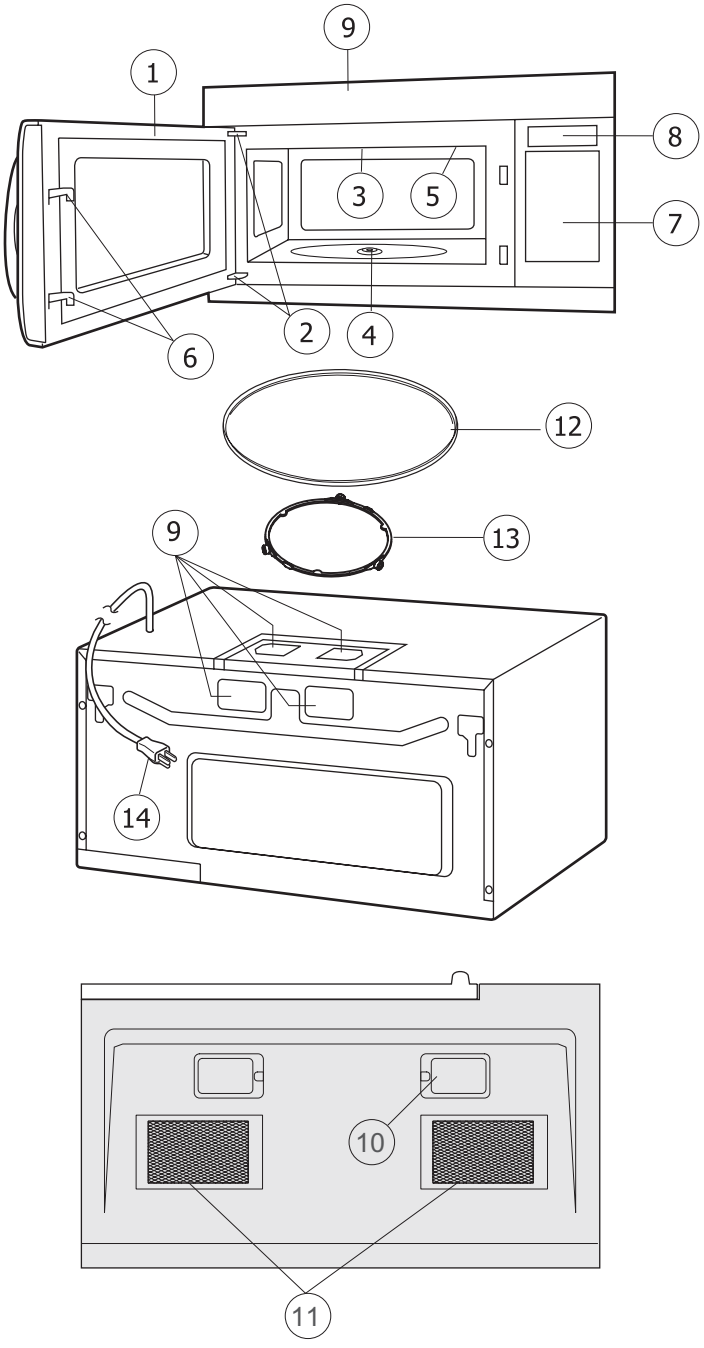
The oven is equipped with a 3-prong grounding plug. DO NOT UNDER ANY CIRCUMSTANCES CUT OR REMOVE THE GROUNDING PIN FROM THE PLUG. The power supply cord and plug must be connected to a separate 120 Volt AC, 60 Hz, 15 Amp. or more dedicated line, using a grounded receptacle. When installing this appliance, observe all applicable codes and ordinances. A short power-supply cord is provided to reduce risks of becoming entangled in or tripping over a longer cord. Where a two-pronged wall-receptacle is encountered, it is the personal responsibility and obligation of the customer to contact a qualified electrician and have it replaced with a properly grounded three-pronged wall receptacle or have a grounding adapter properly grounded and polarized.

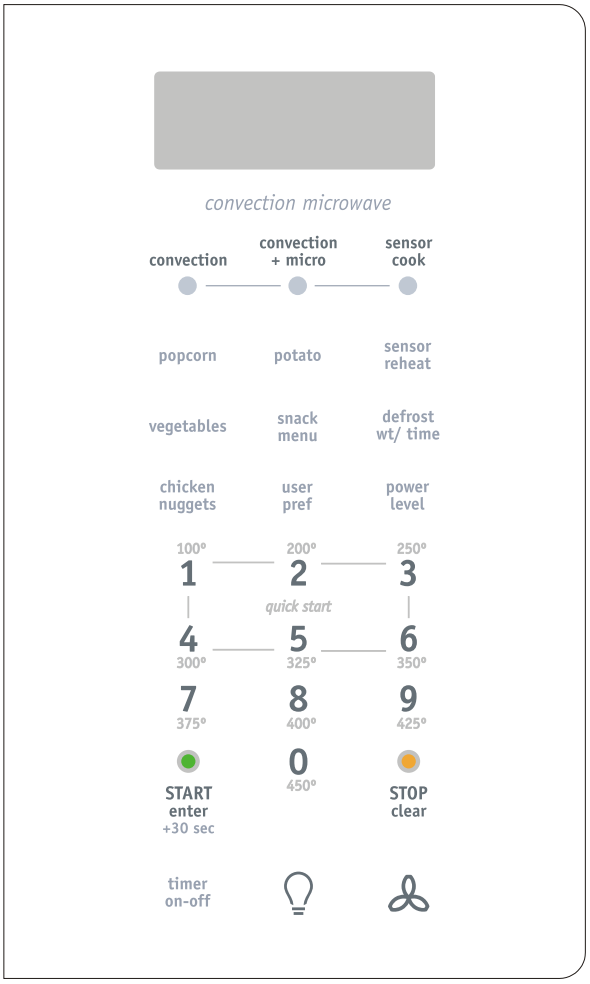


If an extension cord must be used, it should be a 3-wire, 15 amp. or more cord. Do not drape over a countertop or table where it can be pulled on by children or tripped over accidentally.

Oven Diagram

1. Oven door with see-through window.
2. Door hinges.
3. Waveguide cover.
4. Turntable motor shaft.
5. Oven lamp. It will light when oven is operating or door is open.
6. Door latches. The oven will not operate unless the door is securely closed.
7. Auto Touch control panel
8. Time display: Digital display, 99 minutes 99 seconds.
9. Ventilation openings.
10. Light Cover.
11. Grease filters.
12. Removable turntable. The turntable will rotate clockwise or counterclockwise. Only remove for cleaning.
13. Removable turntable support.
14. Power supply cord





Operating Sequence Description

The following is a description of component functions during oven operation.

OFF CONDITION

Closing the door activates the door sensing switch and secondary interlock switch. (In this condition, the monitor switch contacts are opened.) When oven is plugged in, 120 volts AC is supplied to the control unit. (Figure 2-1).

1. The display will show "ENJOY YOUR OVEN PRESS CLEAR". To set any program or set the clock, you must first touch the STOP/CLEAR button. The display will clear, and " : " appears.

COOKING CONDITION

Program desired cooking time touching the NUMBER pads. When the START pad is touched, the following operations occur:

1. The contacts of relays are closed and components connected to the relays are turned on as follows. (For details, refer to Figure 2-2)

RELAY	CONNECTED COMPONENTS
RY1	Oven Lamp / Fan motor / Stirrer motor
RY2	Power Transformer
RY7	Turntable Motor

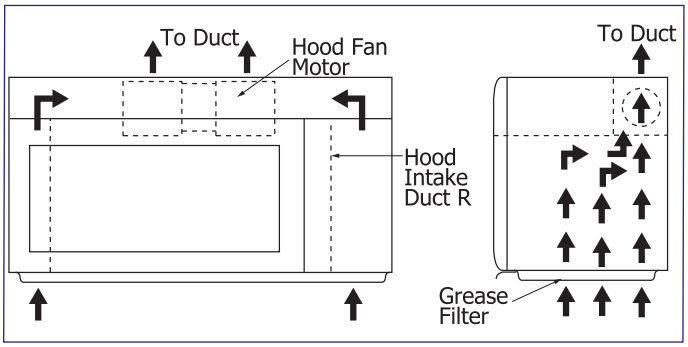
2. 120 volts AC is supplied to the primary winding of the power transformer and is converted to about 3.3 volts AC output on the filament winding, and approximately 2000 volts AC on the high voltage winding.
3. The filament winding voltage heats the magnetron filament and the H.V. winding voltage is sent to a voltage doubler circuit.
4. The microwave energy produced by the magnetron is channeled through the waveguide into the cavity feedbox, and then into the cavity where the food is placed to be cooked.
5. Upon completion of the cooking time, the power transformer, oven lamp, etc. are turned off, and the generation of microwave energy is stopped. The oven will revert to the OFF condition.
6. When the door is opened during a cook cycle, monitor switch, door sensing switch, primary interlock switch, and secondary interlock relay are activated with the following results. The circuits to the stirrer motor, the cooling fan motor, the turntable motor, and the high voltage components are de-energized, and the digital read-out displays the time still remaining in the cook cycle when the door was opened.
7. The monitor switch, which is electrically monitoring the operation of the primary interlock switch and door sensing switch, is mechanically associated with the door so that it will function in the following sequence.
   (1) When the door opens from a closed position, the secondary interlock relay, door sensing switch and primary interlock switch open their contacts, and then the monitor switch contacts close.
   (2) When the door is closed from the open position, the monitor switch contacts open first. Then the contacts of the primary interlock switch and door sensing switch close, and contacts of the relay (RY1) open.

If the primary interlock switch and secondary interlock relay (RY2) fail with the contacts closed when the door is opened, the closing of the monitor switch contacts will form a short circuit through the monitor fuse, primary interlock switch, relay (RY1) and secondary interlock relay (RY2), causing the monitor fuse to blow.

VENTILATION METHODS HOT AIR EXHAUST

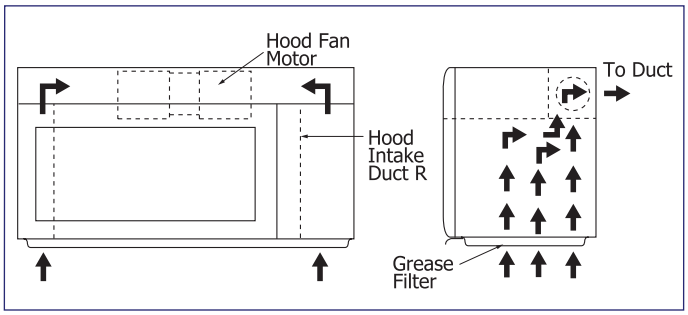
1. Vertical Venting

For this venting method, hot air rising from the conventional range below is drawn in by the hood fan motor through the grease filters at the right and left sides of the base cover, up through the right and left sides of the oven cavity, then discharged vertically at rear center top of the oven, into the customer's vent system.



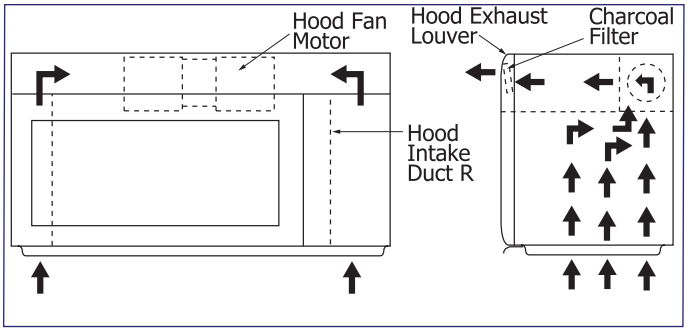
2. Horizontal Venting

The air handing is the same as Vertical Venting except that final air discharge is directed horizontally out from the top rear of oven into the customer's vent system.



3. Re-circulation (Inside venting)

The air handing is the same as VERTICAL VENTING except that the final air discharge is directed horizontally through the upper front of the oven into the kitchen. In this case, the accessory charcoal Filter RK-240 must be provided to filter the air before it leaves the oven.



POWER LEVEL P-0 TO P-90 COOKING

When Variable Cooking Power is programmed, the 120 volts A.C. is supplied to the power transformer intermittently through the contacts of relay (RY2) which is operated by the control unit within an interval second time base. Microwave power operation is as follows:

Vari-Mode	ON TIME	OFF TIME
Power 10 (High) (100% Power)	29 sec.	0 sec.
Power 9 (P-90) (Approx. 90%)	26 sec.	3 sec.
Power 8 (P-80) (Approx. 80%)	23 sec.	6 sec.
Power 7 (P-70) (Approx. 70%)	20 sec.	9 sec.
Power 6 (P-60) (Approx. 60%)	17 sec.	12 sec.
Power 5 (P-50) (Approx. 50%)	14 sec.	15 sec.
Power 4 (P-40) (Approx. 40%)	11 sec.	18 sec.
Power 3 (P-30) (Approx. 30%)	8 sec.	21 sec.
Power 2 (P-20) (Approx. 20%)	5 sec.	24 sec.
Power 1 (P-10) (Approx. 10%)	3 sec.	26 sec.
Power 0 (P-0) (0% power)	0 sec.	29 sec.

NOTE

The ON/OFF time ratio does not correspond with the percentage of microwave power, because approximately 2 seconds are needed for heating of the magnetron filament.

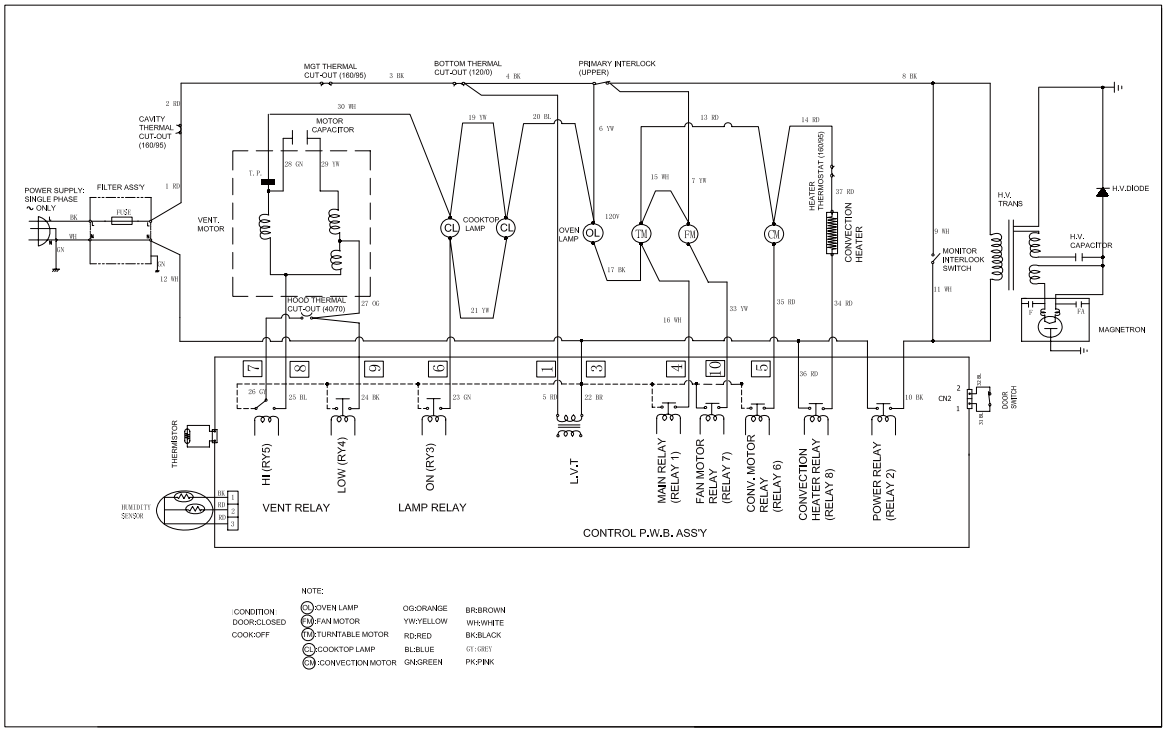


Figure O-1. Oven Schematic-Off Condition

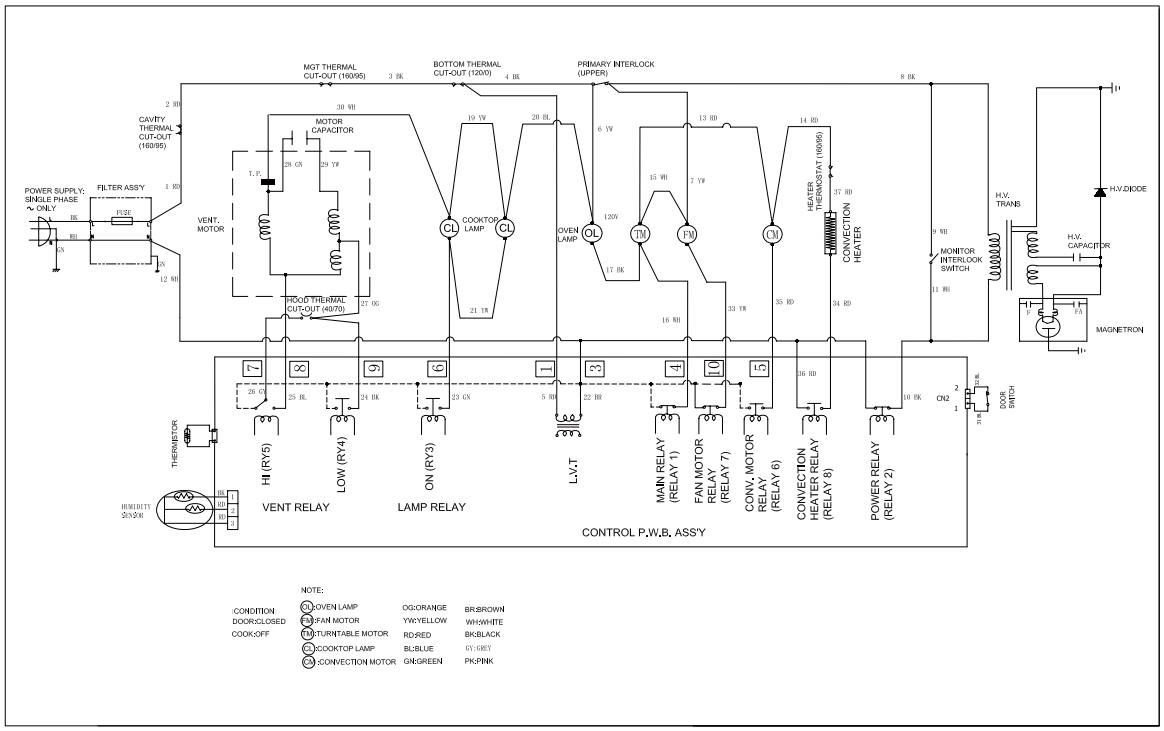


Figure O-2. Oven Schematic-Cooking Condition

Touch Control Panel Assembly Outline

The touch control section consists of the following units.
(1) Key unit
(2) Control Unit: The Control unit consists of LSI Unit and Power Unit.

The principal functions of these units and the signals communicated among them are explained below.

KEY UNIT

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through P20, P21, P22, P25, and P26. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through P43, P44, P45 and P46 to perform the function that was requested.

CONTROL UNIT

Control unit consists of LSI, power source circuit, synchronizing signal circuit, reset circuit, buzzer circuit, relay circuit indicator circuit and back light circuit.

1. (LSI)
   This LSI controls the key strobe signal, relay driving signal for oven function and indicator signal.
2. Power Source Circuit
   This circuit generates voltages necessary for the control unit from the AC line voltage. In addition, the synchronizing signal is available in order to compose a basic standard time in the clock circuit.

Symbol	Voltage	Application
VC	-5.3V	LSI(IC1)

3. Synchronizing Signal Circuit
   The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It incorporates a very small error because it works on commercial frequency.
4. Reset Circuit
   This circuit generates a signal which resets the LSI (IC1) to the initial state when power is supplied.
5. Buzzer Circuit
   The buzzer is responds to signals from the LSI to emit audible sounds (key touch sound and completion sound).
6. Door Sensing Switch
   A switch to inform the LSI if the door is open or closed.
7. Relay Circuit
   To drive the magnetron, fan motor, turntable motor, hood motor, and light the oven lamp and hood lamp.
8. Indicator Circuit
   This circuit consists of 25 segments and 4 common electrodes using a Light Crystal Display.
9. Back Light Circuit
   A circuit to drive the back light (Light emitting diodes LD1-LD4).

Component Descriptions

DOOR OPEN MECHANISM

The door is opened by pulling the door handle, refer to the Figure 2-3.

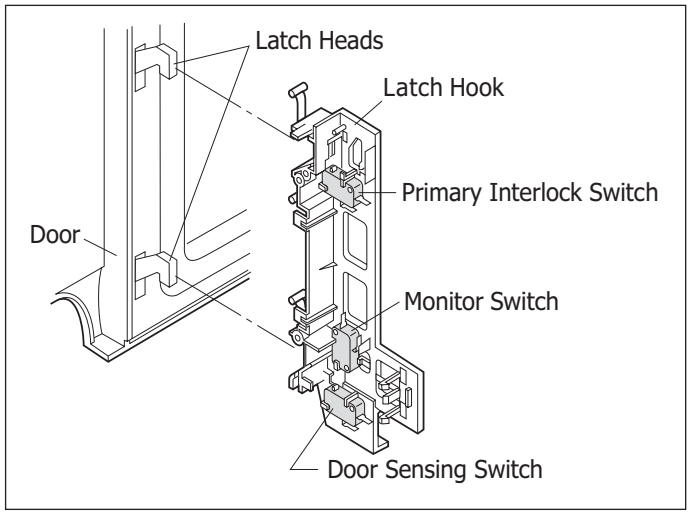


Figure 2-3. Door Open Mechanism

DOOR SENSING SWITCH AND PRIMARY INTERLOCK SWITCH

The primary interlock switch is mounted in the upper position of the latch hook. The door sensing switch in the primary interlock system is mounted in the lower position of the latch hook which is mounted on the upper position of the latch hook. They are activated by the latch heads on the door. When the door is opened, the switches interrupt the circuit to all components. A cook cycle cannot take place until the door is firmly closed, thereby activating both interlock switches. The primary interlock system consists of the door sensing switch and secondary interlock relay located on the control circuit board.

MONITOR SWITCH

The monitor switch is activated (the contacts opened) by the latch head on the door while the door is closed. The switch is intended to render the oven inoperative, by means of blowing the monitor fuse, when the contacts of the secondary interlock relay (RY2) and primary interlock switch fail to open when the door is opened.

Functions:

1. When the door is opened, the monitor switch contact close (to the ON condition) due to their being normally closed. At this time the secondary interlock relay (RY2), and primary interlock switch are in the OFF condition (contacts open) due to their being normally open contact switches. The contacts of relay (RY1) are in the ON condition (contacts close).
2. As the door goes to a closed position, the monitor switch contacts are first opened and then the door sensing switch and the primary interlock switch contacts close. (On opening the door, each of these switches operate inversely.)
3. If the door is opened, and the secondary interlock relay (RY2) and primary interlock switch contacts fail to open, the monitor fuse blows simultaneously with closing of the monitor switch contacts.

CAUTION

Before replacing a blown monitor fuse test the door sensing switch, secondary interlock relay (RY2), relay (RY1), primary interlock switch and monitor switch for proper operation. (Refer to "Test Procedure").

NOTE

Monitor fuse and switch are replaced as an assembly.

THERMAL CUT-OUT (CAVITY)

This thermal cut-out is located on the top of the oven cavity. It is designed to prevent damage to the oven unit if the food in the oven catches fire due to overheating produced by improper setting of cooking time or failure of control unit. Under normal operation, the thermal cut-out remains closed. However, the thermal cut-out will open at 230°F (110°C) causing the oven to shut down.

THERMAL CUT-OUT (HOOD)

This thermal cut-out located on the right base plate. It is designed to automatically turn on the hood fan motor whenever the hot air rising from the conventional range below causes the temperature at the thermal cut-out to rise to 158°F (70°C) or higher, thus removing this hot air from around microwave oven. When the temperature around the thermal cut-out drops to 104°F (40°C) or lower, the thermal cut-out shuts off the hood fan motor.

TURNTABLE MOTOR

The turntable motor rotates the turntable located on the bottom of the oven cavity, so that the foods on the turntable cook evenly during cooking. Turntable will turn in either direction.

COOLING FAN MOTOR

The cooling fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapors given off from the heating foods. It is then exhausted through exhausting air vents at the oven cavity.

HOOD FAN MOTOR

The hood fan motor is a two-speeds, single-phase, double pole induction type, requiring a hood fan capacitor. It is located outside the upper rear part of the oven cavity. The hood fan motor removes hot air from around the oven as it rises from the conventional electric or gas range over which it is installed. This air is then expelled either vertically or horizontally through the customer supplied duct system, or discharged back into the kitchen.

HOOD LAMP

The hood lamps are mounted at the hood lamp angle on the base cover. The hood lamps can be turned off and on.

Notes

Troubleshooting Guide

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure "section.

⚠ CAUTION

If the oven becomes inoperative because of a blown monitor fuse, check the monitor switch, relay (RY1) secondary interlock relay (RY2), door sensing switch and primary interlock switch before replacing the monitor fuse. If the monitor fuse is replaced, the monitor switch must also be replaced.

⚠ WARNING

Whenever troubleshooting is performed with the power supply cord disconnected. It may in, some cases, be necessary to connect the power supply cord after the outer case has been removed, in this event:

1. **Disconnect the power supply cord, and then remove outer case.**
2. **Open the door and block it open.**
3. **To discharge high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**
4. **Disconnect the leads to the primary of the power transformer.**
5. **Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.**

⚠ WARNING

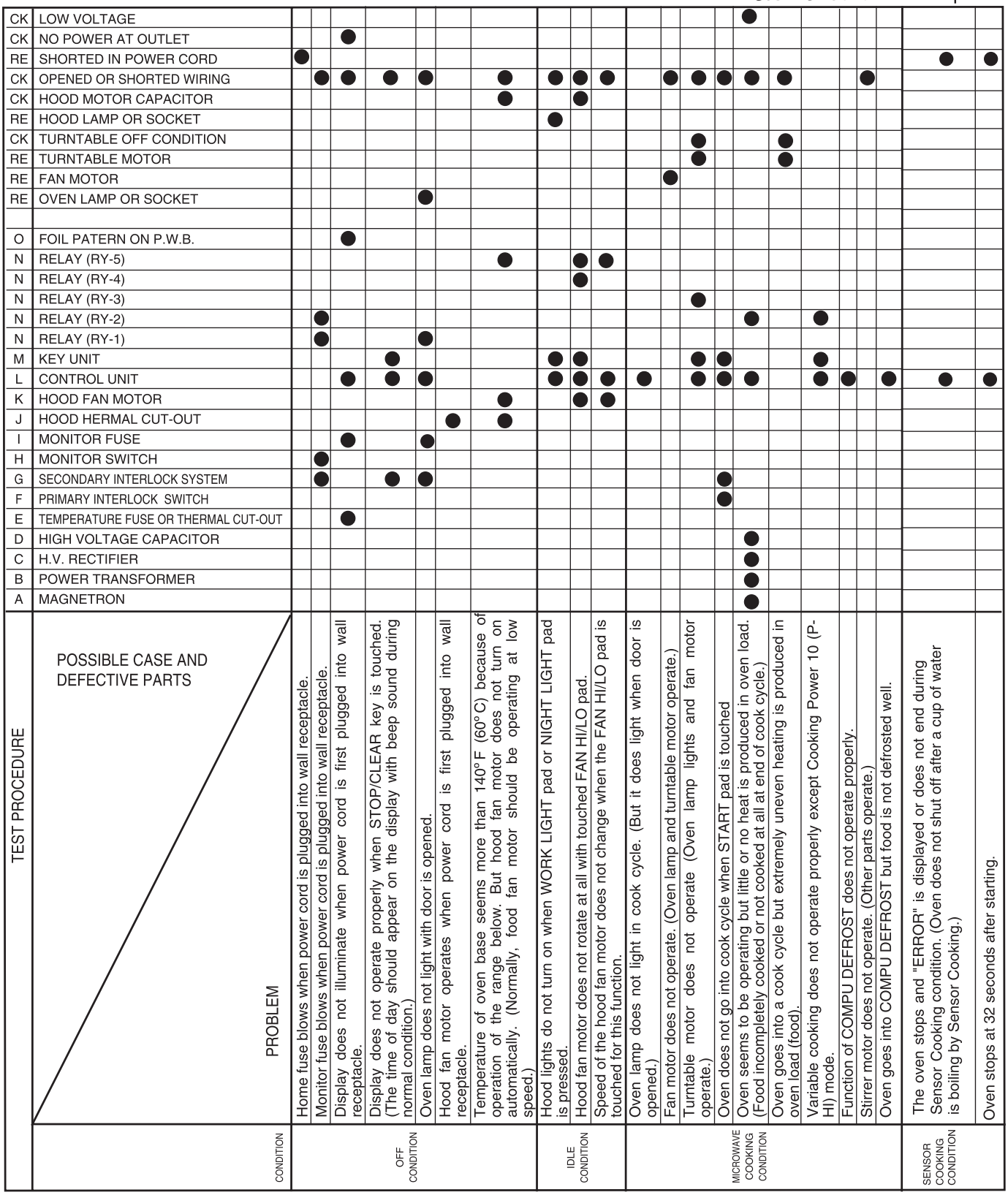
When the testing is completed:

1. **Disconnect the power supply cord, and then remove outer case.**
2. **Open the door and block it open.**
3. **To discharge high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**
4. **Reconnect the leads to the primary of the power transformer.**
5. **Reinstall the outer case (cabinet).**
6. **Reconnect the power supply cord after the outer case is installed.**
7. **Run the oven and check all functions.**

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and then set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out Before Servicing procedure and re-examine the connections to the component being tested.

When all service work is completed and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test should be carried out.

CK = Check / RE = Replace


TEST PROCEDURE
POSSIBLE CASE AND DEFECTIVE PARTS
PROBLEM
CONDITION
CK LOW VOLTAGE
CK NO POWER AT OUTLET
RE SHORTED IN POWER CORD
CK OPENED OR SHORTED WIRING
CK HOOD MOTOR CAPACITOR
RE HOOD LAMP OR SOCKET
CK TURNTABLE OFF CONDITION
RE TURNTABLE MOTOR
RE FAN MOTOR
RE OVEN LAMP OR SOCKET
O FOIL PATERN ON P.W.B.
N RELAY (RY-5)
N RELAY (RY-4)
N RELAY (RY-3)
N RELAY (RY-2)
N RELAY (RY-1)
M KEY UNIT
L CONTROL UNIT
K HOOD FAN MOTOR
J HOOD HERMAL CUT-OUT
I MONITOR FUSE
H MONITOR SWITCH
G SECONDARY INTERLOCK SYSTEM
F PRIMARY INTERLOCK SWITCH
E TEMPERATURE FUSE OR THERMAL CUT-OUT
D HIGH VOLTAGE CAPACITOR
C H.V. RECTIFIER
B POWER TRANSFORMER
A MAGNETRON
OFF CONDITION
Home fuse blows when power cord is plugged into wall receptacle.
Monitor fuse blows when power cord is plugged into wall receptacle.
Display does not illuminate when power cord is first plugged into wall receptacle.
Display does not operate properly when STOP/CLEAR key is touched. (The time of day should appear on the display with beep sound during normal condition.)
Oven lamp does not light with door is opened.
Hood fan motor operates when power cord is first plugged into wall receptacle.
Temperature of oven base seems more than 140°F (60°C) because of operation of the range below. But hood fan motor does not turn on automatically. (Normally, food fan motor should be operating at low speed.)
IDLE CONDITION
Hood lights do not turn on when WORK LIGHT pad or NIGHT LIGHT pad is pressed.
Hood fan motor does not rotate at all with touched FAN HI/LO pad.
Speed of the hood fan motor does not change when the FAN HI/LO pad is touched for this function.
MICROWAVE COOKING CONDITION
Oven lamp does not light in cook cycle. (But it does light when door is opened.)
Fan motor does not operate. (Oven lamp and turntable motor operate.)
Turntable motor does not operate (Oven lamp lights and fan motor operate.)
Oven does not go into cook cycle when START pad is touched
Oven seems to be operating but little or no heat is produced in oven load. (Food incompletely cooked or not cooked at all at end of cook cycle.)
Oven goes into a cook cycle but extremely uneven heating is produced in oven load (food).
Variable cooking does not operate properly except Cooking Power 10 (P-HI) mode.
Function of COMPU DEFROST does not operate properly.
Stirrer motor does not operate. (Other parts operate.)
Oven goes into COMPU DEFROST but food is not defrosted well.
SENSOR COOKING CONDITION
The oven stops and "ERROR" is displayed or does not end during Sensor Cooking condition. (Oven does not shut off after a cup of water is boiling by Sensor Cooking.)
Oven stops at 32 seconds after starting.

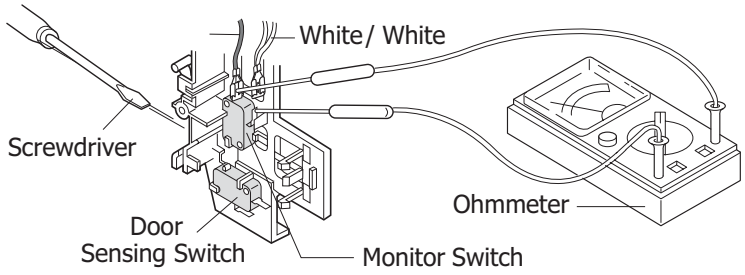
Test Procedures

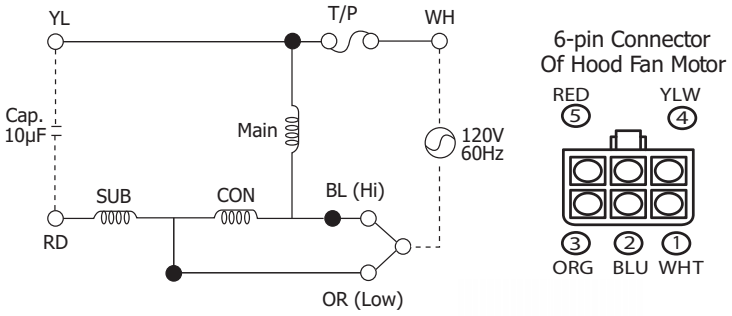
Procedure Letter	Component Test
A	**MAGNETRON ASSEMBLY TEST** **⚠ WARNING** **High voltages are present during the cook cycle, so extreme caution should be observed. Discharge the high voltage capacitor before touching any oven components or wiring.** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. To test for an open filament, isolate the magnetron from the high voltage circuit. A continuity check across the magnetron filament leads should indicate less than 1 ohm. 5. To test for a shorted magnetron, connect the ohmmeter leads between the magnetron filament leads and chassis ground. This test should indicate an infinite resistance. If there is little or no resistance the magnetron is grounded and must be replaced. 6. Reconnect all leads removed from components during testing. 7. Reinstall the outer case (cabinet). 8. Reconnect the power supply cord after the outer case is installed. 9. Run the oven and check all functions. MICROWAVE OUTPUT POWER Power output of the magnetron can be measured by performing a water temperature rise test. This test should only be used if above tests do not indicate a faulty magnetron and there is no defect in the following components or wiring: silicon rectifier, high voltage capacitor and power transformer. This test will require a 16 ounce (453 cc.) measuring cup and an accurate mercury thermometer or thermocouple type temperature tester. For accurate results, the following procedure must be followed carefully: 1. Fill the measuring cup with 16 oz. (453 cc.) of tap water and measure the temperature of the water with a thermometer or thermocouple temperature tester. Stir the thermometer or thermocouple through the water until the temperature stabilizes. Record the temperature of the water. 2. Place the cup of water in the oven. Operate oven at 100% POWER selecting more than 60 seconds cook time. Allow the water to heat for 60 seconds, measuring with a stop watch, second hand of a watch or the digital read-out countdown. 3. Remove the cup from the oven and again measure the temperature, making sure to stir the thermometer or thermocouple through the water until the maximum temperature is recorded. 4. Subtract the cold water temperature from the hot water temperature. The normal result should be 29.2 to 54.2°F (16.2 to 30.1°C) rise in temperature. If the water temperatures are accurately measured and tested for the required time period the test results will indicate if the magnetron tube has low power output (low rise in water temperature) which would extend cooking time or high power output (high rise in water temperature) which would reduce cooking time. Because cooking time can be adjusted to compensate for power output, the magnetron tube assembly should be replaced only if the water temperature rise test indicates a power output well beyond the normal limits. The test is only accurate if the power supply line voltage is 120 volts and the oven cavity is clean.

Procedure Letter	Component Test
B	**POWER TRANSFORMER TEST** **WARNING** **Do not touch the components of the power transformer while power transformer is energized. It is dangerous because this has high voltage components. (High voltages are present at the high voltage terminal, so do not attempt to measure the filament and high voltage.)** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Disconnect the primary input terminals and measure the resistance of the transformer with an ohmmeter. Check for continuity of the coils with an ohmmeter. On R x 1 scale, the resistance of the primary coil should be less than 1 ohm and the resistance of the high voltage coil should be approximately 83 ohms; the resistance of filament coil should be less than 1 ohm. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions.
C	**HIGH VOLTAGE RECTIFIER TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Isolate the rectifier from the circuit. Using the highest ohm scale of the meter, read the resistance across the terminals and observe, reverse the leads to the rectifier terminals and observe meter reading. If a short is indicated in both directions, or if an infinite resistance is read in both directions, the rectifier is probably defective and should be replaced. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. **NOTE** Be sure to use an ohmmeter that will supply a forward bias voltage of more than 6.3 volts.

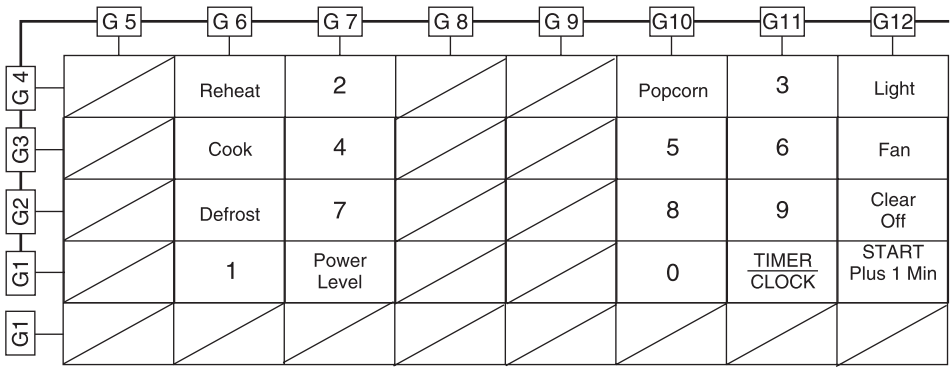
Procedure Letter	Component Test
D	**HIGH VOLTAGE CAPACITOR TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. If the capacitor is open, no high voltage will be available to the magnetron. Disconnect input leads and check for short or open between the terminals using an ohmmeter. Checking with a high ohm scale, if the high voltage capacitor is normal, the meter will indicate continuity for a short time and should indicate an open circuit once the capacitor is charged. If the above is not the case, check the capacitor with an ohmmeter to see if it is shorted between either of the terminals and case. If it is shorted, replace the capacitor. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions.
E	**CAVITY THERMAL CUT-OUT TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. A continuity check across the thermal cut-out terminals should indicate a closed circuit unless the temperature of the thermal cut-out reaches approximately 230°F(110°C). An open thermal cut-out indicates overheating of the oven, exchange thermal cut-out and check inside of oven cavity for improper setting of cooking time or operation of control unit. Check for restricted air flow through the vent holes of the oven cavity, especially the cooling fan and air guide. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. MAGNETRON TEMPERATURE FUSE TEST 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. A continuity check across the magnetron temperature fuse terminals should indicate a closed circuit unless the temperature of the magnetron temperature fuse reaches approximately 302°F (150°C). An open magnetron temperature fuse indicates overheating of the magnetron. Check for restricted air flow to the magnetron, especially the cooling fan air guide. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. **⚠ CAUTION** **If the temperature fuse indicates an open circuit at room temperature, replace temperature fuse.**

Procedure Letter	Component Test
F	**PRIMARY INTERLOCK SWITCH TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Isolate the switch and connect the ohmmeter to the common (COM.) and normally open (NO) terminal of the switch. The meter should indicate an open circuit with the door open and a closed circuit with the door closed. If improper operation is indicated, replace the primary interlock switch. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions.
G	**PRIMARY INTERLOCK SYSTEM TEST** DOOR SENSING SWITCH 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Isolate the switch and connect the ohmmeter to the common (COM.) and normally open (NO) terminal of the switch. The meter should indicate an open circuit with the door open and a closed circuit with the door closed. If improper operation is indicated, replace the door sensing switch. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. **⚠ CAUTION** **If the door sensing switch contacts fail in the open position and the door is closed, the cooling fan, turntable and oven light will be activated by RY1.** SECONDARY INTERLOCK RELAY (RY2) 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Disconnect two (2) wire leads from the male tab terminals of the Secondary Interlock Relay. Check the state of the relay contacts using an ohmmeter. The relay contacts should be open. If the relay contacts are closed, replace the circuit board entirely or the relay itself. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions.

Procedure Letter	Component Test
H	**MONITOR SWITCH TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Before performing this test, make sure that the secondary interlock switch and the primary interlock relay are operating properly, according to the Switch Test Procedure. Disconnect the wire lead from the monitor switch (COM) terminal. Check the monitor switch operation by using the ohmmeter as follows. When the door is open, the meter should indicate a closed circuit. When the monitor switch actuator is pushed by a screwdriver through the lower latch hole on the front plate of the oven cavity with the door opened (in this condition the plunger of the monitor switch is pushed in), the meter should indicate an open circuit. If improper operation is indicated, the switch may be defective. After testing the monitor switch, reconnect wire lead to monitor switch (COM) terminal and check continuity of monitor circuit. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. 
J	**HOOD THERMAL CUT-OUT TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. A continuity check across the thermal cut-out terminals should indicate an open circuit unless the temperature of the thermal cut-out reaches approximately 158°F (70°C) or more. At that temperature, the contacts will close. The thermal cut-out opens automatically at approximately 104°F (40°C). 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions.

Procedure Letter	Component Test
K	**HOOD FAN MOTOR TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. If the motor does not turn, touch the FAN button once and check voltage between pins "1" and "2" (Blue and Black wires) of the 6 pin connector. If 120 Volts appear and the hood capacitor is good, replace the hood fan assembly. If 120 Volts does not appear, check the motor circuit. The resistance values of motor terminals are as follows: 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. WHT (1) AND YLW (4) = 0Ω (Shorted) BLU (2) AND YLW (4) = 34Ω WHT (1) AND BLK (2) = 34Ω RED (5) AND WHT(1) = 77Ω RED (5) AND BLU (2) = 43Ω YLW (4) AND RED (5) = 77Ω 
L	**TOUCH CONTROL PANEL ASSEMBLY TEST** The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter. In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and troubleshooting by unit replacement is described according to the symptoms indicated. **Before testing,** 1. Disconnect power supply cord, and remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Remove two (2) screws holding the hood intake duct R to the oven cavity top plate and the base plate R. And remove the hood intake duct R. 5. Disconnect the leads to the primary of the power transformer. 6. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. Continued on next page.

Procedure Letter	Component Test
	KEY UNIT NOTES: 1. Check key unit ribbon connection before replacement. 2. Reconnect all leads removed from components during testing. 3. Re-install the hood intake duct R with two (2) screws.1. Re-install the outer case (cabinet). 4. Reconnect the power supply cord after the outer case is installed. 5. Run the oven and check all functions. The following symptoms indicate a defective key unit. a) When touching the pads, a certain pad produces no signal at all. b) When touching a number pad, two figures or more are displayed. c) When touching the pads, sometimes a pad produces no signal. If the key unit is defective. 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. To discharge high voltage capacitor, wait for 60 seconds. 4. Replace the key unit. 5. Reconnect all leads removed from components during testing. 6. Re-install the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. CONTROL UNIT The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Key unit test (Procedure M) to determine if control unit is faulty. 1. In connection with pads. a) When touching the pads, a certain group of pads do not produce a signal. b) When touching the pads, no pads produce a signal. 2. In connection with indicators. a) At a certain digit, all or some segments do not light up. b) At a certain digit, brightness is low. c) Only one indicator does not light. d) The corresponding segments of all digits do not light up; or they continue to light up. e) Wrong figure appears. f) A certain group of indicators do not light up. g) The figure of all digits flicker. 3. Other possible problems caused by defective control unit. a) Buzzer does not sound or continues to sound. b) Clock does not operate properly. c) Cooking is not possible. **When testing is completed,** 1. Disconnect the power supply cord. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Reconnect all leads removed from components during testing. 5. Re-install the hood intake duct R. 6. Re-install the outer case (cabinet). 7. Reconnect the power supply cord after the case is installed. 8. Run the oven and check all functions.

Procedure Letter	Component Test
M	**KEY UNIT TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Remove the control panel assembly. 5. If the display fails to clear when the CLEAR-OFF pad is depressed, first verify the flat ribbon cable is making good contact, verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch (stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connector). Use the Key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the CLEAR-OFF pad making momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault. 5. Reconnect all leads removed from components during testing. 6. Re-install the outer case (cabinet). 7. Reconnect the power supply cord. 8. Run the oven and check all functions. 

Procedure Letter	Component Test
N	**RELAY TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. Remove the hood intake duct R. 5. Disconnect the leads to the primary of the power transformer. 6. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. 7. After that procedure, re-connect the power supply cord. 8. Check voltage between normal open terminal of the relay RY2 and the normal open terminal of the relay RY1 on the control unit with an A.C. voltmeter. The meter should indicate 120 volts, if not check oven circuit. These relays are operated by D.C. voltage Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation. DC. voltage indicated..... Defective relay. DC. voltage not indicated ..... Check diode which is connected to the relay coil. If diode is good, control unit is defective. RELAY SYMBOL / OPERATIONAL VOLTAGE / CONNECTED COMPONENTS RY 1 / Approx. 26.6V D.C. / Oven lamp / Fan motor / Turntable motor RY2(COOK) / Approx. 26.0V D.C. / Power transformer RY4 / Approx. 26.6V D.C. / Hood motor RY 3 / Approx. 26.6V D.C. / Hood lamp 9. Disconnect the power supply cord and then remove outer case. 10. Open the door and block it open. 11. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 12. Reconnect all leads removed from components during testing. 13. Re-install the hood intake duct R. 14. Re-install the outer case (cabinet). 15. Reconnect the power supply cord after the outer case is installed. 16. Run the oven and check all functions.
K	**DEFROST CENTER TEST** 1. Open the door. 2. Place one cup of water in the center of the turntable tray in the oven cavity. 3. Close the door. 4. Touch the "DEFROST" pad once. 5. Touch the number pad "2". 6. Touch the number pad "5". 7. Touch the " START " button. 8. The oven is in Defrost Center cooking condition. 9. The oven will operate as follows. Menu / 1ST STAGE / 2ND STAGE Steaks/Chops 0.5lbs / LEVEL: 60% / TIME: 57sec. / LEVEL: 40% / TIME: 17sec. 10. If improper operation is indicated, the control unit is probably defective and should be checked.

Procedure Letter	Component Test
P	**FOIL PATTERN ON THE PRINTED WIRING BOARD TEST**

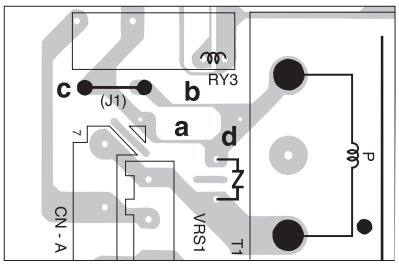
To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse.

Fuse check and repairs.

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)
4. Remove the control unit.
5. Follow the troubleshooting guide given below for repair.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder.
2	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d".

6. Make a visual inspection of the varistor. Check for burned damage and examine the transformer with a tester for the presence of layer short-circuit (check the primary coil resistance which is approximately 215Ω ± 10%). If any abnormal condition is detected, replace the defective parts.
7. Reconnect all leads removed from components during testing.
8. Re-install the control unit to the control panel and re-install the control panel to the oven.
9. Reconnect the power supply cord.
10. Run the oven and check all functions.



Follow the troubleshooting guide given below, if indicator does not light up after above check and repairs are finished.

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Remove the hood intake duct R.
5. Disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, re-connect the power supply cord.
7. Follow the troubleshooting guide given below for repair.

Steps	Occurrence	Cause Or Correction
1	The rated AC voltage is not present between the normal open terminal of the relay RY2 and the normal open terminal of the relay RY1.	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.

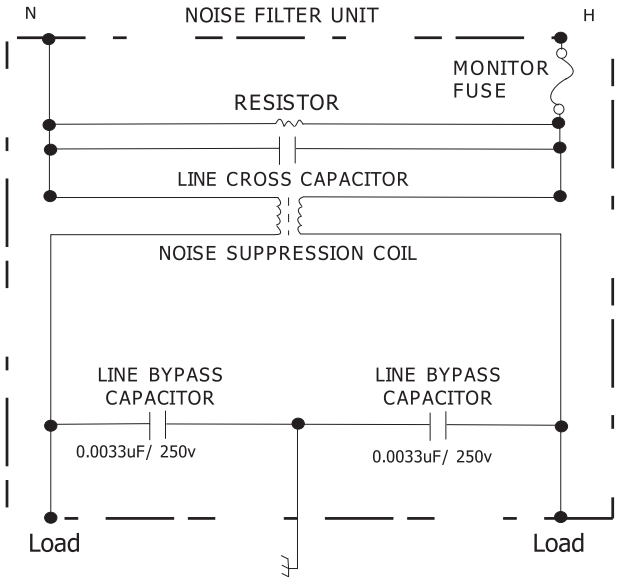
8. Disconnect the power supply cord.
9. Open the door and block it open.
10. To discharge high voltage capacitor, wait for 60 seconds.
11. Reconnect all leads removed from components during testing.
12. Re-install the hood intake duct R.
13. Re-install the outer case (cabinet).
14. Reconnect the power supply cord after the outer case is installed.
15. Run the oven and check all functions.

Procedure Letter	Component Test
Q	**NOISE FILTER TEST** 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Disconnect the leads to the primary of the power transformer. 5. Using an ohm-meter, check between the terminals as described in the following table:

Measuring Point	Indication Of Ohm-meter
Between N and H	Open Circuit
Between terminal N and LOAD	Short Circuit
Between terminal H and LOAD	Short Circuit

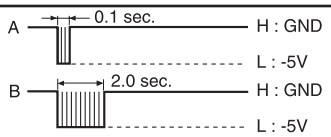
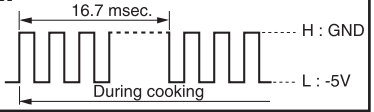
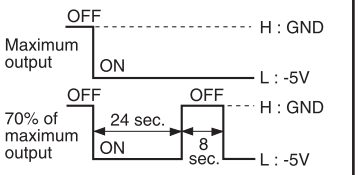
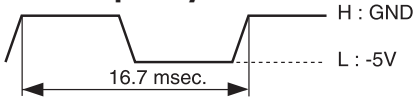
If incorrect readings are obtained, replace the noise filter.

6. Reconnect all leads removed from components during testing.
7. Re-install the outer case (cabinet).
8. Reconnect the power supply cord after the outer case is installed.
9. Run the oven and check all functions.



Description of LSI

The I/O signal of the LSI is detailed in the following table.

Pin#	Signal	I/O	Description
1-2	VL2-VL1	IN	**Power source voltage input terminal.** Standard voltage for LCD.
3-6	AN7-AN4	IN	**Terminal to change cooking input according to the Model.** By using the A/D converter contained in the LSI, DC voltage in accordance with the Model in operation is applied to set up its cooking constant.
7	AN3	OUT	Back light circuit (Light emitting diodes) driving signal.
8	AN2	IN	To input signal which communicates the door open/close information to LSI. Door close "H" level signal (0V). Door open "L" level signal (-5V).
9-10	AN1-AN0	OUT	Terminal not used.
11-13	P57-P55	OUT	Terminal not used.
14	CNTR0	OUT OUT	Signal to sound buzzer (2.0 kHz). A: key touch sound. B: Completion sound. 
15	P53	OUT	Terminal not used.
16	P52	OUT	**Oven lamp, fan motor and turntable motor driving signal** To turn on and off shut off relay (RY1). The square waveform voltage is delivered to the RY1 driving circuit and RY2 control circuit. 
17-18	P51-P50	OUT	Terminal not used.
19	P47	OUT	**Magnetron high-voltage circuit driving signal.** To turn on and off the cook relay (RY2). The signals holds "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (variable cooking) the signal turns to "H" level and "L" level in repetition according to the power level.  (ON and OFF times for other power level.)
20	P46	IN	**Signal coming from touch key.** When either G12 line on key matrix is touched, a corresponding signal out of P20, P21, P22, P25 and P26 will be input into P46. When no key is touched, the signal is held at "H" level.
21	P45	IN	**Signal similar to P46.** When either G11 line on key matrix is touched, a corresponding signal will be input into P45.
22	P44	IN	**Signal similar to P46.** When either G10 line on key matrix is touched, a corresponding signal will be input into P44.
23	P43	IN	**Signal similar to P46.** When either G9 line on key matrix is touched, a corresponding signal will be input into P43.
24	INT0	IN	**Signal synchronized with commercial power source frequency.** This is the basic timing for time processing of LSI. 
25	P41	OUT	Terminal not used.
26	P40	IN	Connected to GND through the pull-down resistor R100.
27	RESET	IN	**Auto clear terminal.** Signal is input to reset the LSI to the initial state when power is applied.
28-29	P71-P70	OUT	Terminal not used.
30	XIN	IN	**Internal clock oscillation frequency input setting.** The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.

Pin#	Signal	I/O	Description
31	XOUT	OUT	**Internal clock oscillation frequency control output.** Output to control oscillation input of XIN.
32	VSS	IN	**Power source voltage: -5.0V.** VC voltage of power source circuit input.
34	P26	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P43-P46 terminal while one of G7 line keys on key matrix is touched.
35	P25	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P43-P46 terminal while one of G6 line keys on key matrix is touched.
36	P24	OUT	Terminal not used.
37	P23	OUT	Terminal not used.
38	P22	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P43-P46 terminal while one of G3 line keys on key matrix is touched.
39	P21	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P43-P46 terminal while one of G2 line keys on key matrix is touched.
40	P20	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P43-P46 terminal while one of G1 line keys on key matrix is touched.
41	P17	OUT	Terminal not used.
42	P16	OUT	**Hood lamp driving signal.** To turn on and off relay(RY5). " L " level: During Hood lamp ON. "H" level: During Hood lamp OFF.
43	P15	OUT	Terminal not used.
44	P14	OUT	**Hood motor driving signal.** To turn on and off relay(RY4). "L" level: During Hood motor ON. "H" level: During Hood motor OFF.
45-47	P13-P11	OUT	Terminal not used.
48-50	SEG24-SEG22	OUT	Terminal not used.
51-72	SEG21-SEG0	OUT	**Segment data signal.** Connected to LCD. The relation between signals are as follows: LSI signal (Pin No.) LCD (Pin No.) LSI signal (Pin No.) LCD (Pin No.) SEG 21 (51)----------SEG21 (1) SEG 10 (62)----------SEG10 (12) SEG 20 (52)----------SEG20 (2) SEG 9 (63)----------SEG 9 (13) SEG 19 (53)----------SEG19 (3) SEG 8 (64)----------SEG 8 (14) SEG 18 (54)----------SEG18 (4) SEG 7 (65)----------SEG 7 (15) SEG 17 (55)----------SEG17 (5) SEG 6 (66)----------SEG 6 (16) SEG 16 (56)----------SEG16 (6) SEG 5 (67)----------SEG 5 (17) SEG 15 (57)----------SEG15 (7) SEG 4 (68)----------SEG 4 (18) SEG 14 (58)----------SEG14 (8) SEG 3 (69)----------SEG 3 (19) SEG 13 (59)----------SEG13 (9) SEG 2 (70)----------SEG 2 (20) SEG 12 (60)----------SEG12 (10) SEG 1 (71)----------SEG 1 (21) SEG 11 (61)----------SEG11 (11) SEG 0 (72)----------SEG 0 (22)
73/74	VCC/VREF	IN	Connected to GND.
75	AVSS	IN	Connected to VC.
76	COM3	OUT	Terminal not used.
77	COM2	OUT	**Common data signal: COM2.** Connected to LCD signal COM2
78	COM1	OUT	**Common data signal: COM1.** Connected to LCD signal COM1.
79	COM0	OUT	**Common data signal: COM0.** Connected to LCD signal COM0.
80	VL3	IN	**Power source voltage input terminal.** Standard voltage for LCD.

Notes

WARNING

To prevent an electric shock, take the following precautions:

1. **Before wiring:**
   - **A. Disconnect the power supply.**
   - **B. Open the door and wedge the door open.**
   - **C. Discharge the high voltage capacitor and wait for 60 seconds.**
2. **DO NOT let wire leads touch to the following parts:**
   - **A. High voltage parts: Magnetron, High voltage transformer, High voltage capacitor and High voltage rectifier assembly.**
   - **B. Hot parts: Oven lamp, Magnetron, High voltage transformer and Oven cavity.**
   - **C. Sharp edge: Bottom plate, Oven cavity, Waveguide flange, Chassis support and other metallic plates.**
   - **D. Movable parts (to prevent a fault) Fan blade, Fan motor, lever, Open button.**
3. **Do not catch the wire leads in the outer case cabinet.**
4. **Insert the positive lock connector completely until its pin is locked. Make sure that the wire leads should not come off even if the wire leads are pulled.**
5. **To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.**

WARNING

Avoid possible exposure to microwave energy. Please follow instructions below before operating oven.

1. **Disconnect the power supply cord.**
2. **Make sure that a definite" click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click' as the door switches operate.)**
3. **Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.). Carry out any remedial work that is necessary before operating the oven.**

Do not operate the oven if any of the following conditions exist;

1. **Door does not close firmly.**
2. **Door hinge, support or latch hook is damaged.**
3. **The door gasket or seal is damaged.**
4. **The door is bent or warped.**
5. **There are defective parts in the door interlock system.**
6. **There are defective parts in the microwave generating and transmission assembly.**
7. **There is visible damage to the oven.**

Do not operate the oven:

1. **Without the RF gasket (Magnetron).**
2. **If the wave guide or oven cavity are not intact.**
3. **If the door is not closed.**
4. **If the outer case (cabinet) is not fitted.**

CAUTION

Disconnect oven from power supply before removing outer case. Discharge high voltage capacitor before touching any oven components or wiring after removing outer case.

NOTE

The following adjustments or component replacement can be performed without removing the oven from the wall:

1. Hood lamps, sockets, grease filter and charcoal filter.
2. Base cover and hood lamp glass assembly.
3. Turntable motor.
4. Hood exhaust louver.
5. Control panel assembly or components.

Hood Exhaust Louver Removal

Remove the oven from the wall and proceed as follows:

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.
4. Remove the two (2) screws on the top holding the hood exhaust louver to the oven cavity front face plate.
5. Pull the hood exhaust louver from the oven cavity by pushing the right and left tabs of the hood exhaust louver to remove.
6. Now, the hood exhaust louver is free.

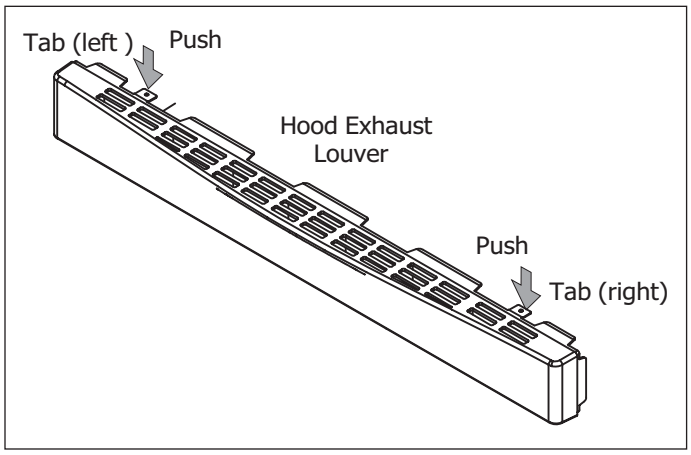


Figure 4-1.

Removal Of Oven From Wall

NOTE

Two persons are recommended to remove the oven from a wall installation.

1. Disconnect the power supply cord, and uncoil the power supply cord.
2. To discharge the high voltage capacitor, wait for 60 seconds.
3. Remove the turntable tray and support from the oven cavity.
4. If the exhaust damper assembly is installed, remove the one (1) screw holding the exhaust damper assembly to the rear stay, and remove the exhaust damper assembly by sliding it backward.
5. Remove the three (3) screws holding the oven (outer case cabinet) to the top cabinet.
6. While supporting the front of the oven, pull down the Three (3) mounting levers and release the oven from the unit mounting plate.
7. Pull the power cord out of the wall cabinet and remove the oven.
8. The oven is now free and can be placed on the work surface selected for servicing the oven.
9. Installation is the reverse of this procedure.

Outer Case Removal

Remove the oven from the wall and proceed as follows:

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.

CAUTION

1. Disconnect oven from power supply before removing outer case.
2. Discharge the high voltage capacitor before touching any oven components or wiring.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Remove two (2) screws holding the top stay to the hood fan motor or the oven, and remove it.
5. Remove the six (6) screws from the rear of the outer case cabinet and two (2) screws at right,and five (5) screws at top.
6. Slide the outer case cabinet back about 1 inch (3 cm)
   to free it from retaining clips on the cavity face plate.
7. Disconnect the three (3) pin connector of the power supply cord from the wiring harness and remove the power supply cord together with the outer case.
8. Nip the cord bushing with bushing pliers and release it from the outer case cabinet.
9. Remove the cord bushing and the power supply cord from the outer case cabinet.
10. Now, the power supply cord is free.

Power Transformer Removal

REMOVAL

1. Disconnect the power supply cord, remove oven from wall, then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Remove three (3) screws holding the base plate to the oven cavity on the bottom , disconnect the wires from turntable motor and two cooktop lamps. And remove the base plate.
5. Disconnect main wire harness from transformer.
6. Disconnect high voltage wire from the transformer.
7. Disconnect filament leads of transformer from the magnetron and capacitor.
8. Remove four (4) screws holding the transformer to bottom plate.

RE-INSTALL

1. Install by sliding the transformer on the bottom plate with its primary terminals toward the control panel.
2. Secure the transformer with four (4) screws to bottom plate.
3. Re-connect wire leads (primary and high voltage) to the transformer and filament leads of transformer to magnetron and high voltage capacitor. Refer to "Wiring Diagrams".
4. Re-install the base plate on the bottom of cavity. Reconnect wire leads to the turntable motor and two cooktop lamps. Re-install the base plat to the cavity with four (4) screws.
5. Re-install the outer case and check that oven is operating properly.

CAUTION

Make sure the wire leads never touch the fan blade.

High Voltage Rectifier And High Voltage Capacitor Removal

1. Disconnect the power supply cord, remove oven from wall, then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Disconnect the high voltage wire lead with high voltage rectifier from the magnetron.
5. Disconnect filament lead of the transformer from high voltage capacitor.
6. Disconnect high voltage wire from capacitor.
7. Remove one (1 screw holding capacitor holder and high voltage rectifier to the fan duct.
8. Disconnect the high voltage rectifier assembly from the high voltage capacitor.
9. The high voltage rectifier assembly is now free. Remove capacitor from the holder.
10. The high voltage capacitor is now free.

CAUTION

When replacing high voltage rectifier and high voltage capacitor, ground side terminal of the high voltage rectifier must be secured firmly with a grounding screw.

Magnetron Removal

1. Disconnect the power supply cord, remove oven from wall, then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Disconnect the high voltage wire lead of the high voltage rectifier assembly from the magnetron.
5. Disconnect the filament lead of the transformer from the magnetron.
6. Disconnect the wire leads of magnetron TCO.
7. Carefully remove three (3) mounting screws holding the magnetron to waveguide. When removing the screws, hold magnetron to prevent it from falling.
8. Remove the magnetron from the unit with care so the magnetron tube should not be hit by any metal object around the tube.

CAUTION

When replacing the magnetron, be sure the R.F. Gasket is in place and mounting screws are tightened securely.

Hood Fan Thermal Cut-Out Removal

1. Disconnect the power supply cord, remove oven from wall, then remove outer case.
2. Open the door and block it open.
3. Remove the one (1) screw holding the control panel to the oven cavity front plate.
4. Push up the control panel and remove it from cavity and hold it at the front plate by the control panel flange. Disconnect wire leads from control panel.
5. Disconnect wire leads from hood fan thermal cut-out.
6. Remove one (1 screw holding the thermal cut-out to the bottom plate (outer case side).
7. Remove the hood fan thermal cut-out from the bottom plate.

Hood Fan Motor Removal

1. Disconnect the power supply cord, remove oven from wall, then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Disconnect the 6-pin connector of the hood fan motor from the main wire harness located at the right edge of the hood duct and release the snap band from the hood duct. Remove one (1) screw holding the Hood fan motor on the rear cavity.
5. Remove hood fan motor from the oven cavity top plate by lifting it up. Hood fan motor is now free.

Thermal Cut-Out (Cavity) Removal

1. Disconnect the power supply cord, remove oven from wall, then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Disconnect the wire leads from the thermal cut-out (cavity).
5. Remove the thermal cut-out (cavity) from the holder at the air duct.

Cooling Fan Motor Removal

1. Disconnect the power supply cord, remove oven from wall, then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Remove the one (1) screw holding the control panel to the oven cavity front plate.
5. Push up the control panel and remove it from cavity and hold it at the front plate by the control panel flange.
6. Disconnect the wire leads from the control panel.
7. Remove two (2) screws holding the fan motor to fan duct.
8. Remove the fan motor from the fan duct and the fan blade by pulling the fan motor with your hand. The fan blade will fall to the bottom plate as the motor is removed.

INSTALLATION

1. Pick up the fan blade with one hand and insert the fan motor shaft into the fan blade hole with the other hand.
2. Install fan motor to fan duct with two (2) screws.

CAUTION

Do not hit the fan blade strongly when installing because the bracket may be deformed.

Make sure that the fan blade rotates smoothly after installation.

Make sure that the axis of the shaft is not slanted.

3. Reconnect the wire leads to the fan motor.
4. Reconnect the wire leads to the control panel.
5. Re-install the control panel with one (1) screw.
6. Refer to procedure of "Removal Of Hood Exhaust Louver" and reverse the procedure to re-install hood exhaust louver.

Servicing The Touch Control Panel

Precautions For Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc. and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

1. When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards in aluminium foil.
2. When soldering, ground the technician and use a grounded soldering iron and work table.

Servicing of Touch Control Panel

The following are procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

A. Servicing the touch control panel with power supply of the oven:

CAUTION

The high voltage transformer of the microwave oven is still live during servicing and presents a hazard.

Therefore, before checking the performance of the touch control panel:

1. Disconnect the power supply cord and then remove the outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Disconnect the leads to the primary of the power transformer.
5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, re-connect the power supply cord.

After checking performance of the touch control panel:

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. Reconnect the leads to the primary of the power transformer.
4. Reinstall the outer case (cabinet).
5. Reconnect the power supply cord after the outer case is installed.
6. Run the oven and check all functions.

a) On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

b) On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which activates an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

B. Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel; it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

Servicing Tools

Tools required to service the touch control panel assembly.

1. Soldering iron: 60W (It is recommended to use a soldering iron with a grounding terminal.)
2. Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
3. Others: Hand tools

Other Precautions

1. Before turning on power source of the control unit, remove the aluminium foil applied for preventing static electricity.
2. Connect the connectors of the key unit to the control unit, being sure that the lead wires are not twisted.
3. After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
4. Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
5. Be sure to use specified components where high precision is required.

Turntable Motor And Food Lamp Sockets Removal

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. Remove the three (3) screws holding the base cover to the oven cavity front face plate.
4. Open the front base cover from cavity front face plate.
5. The base plate is now hanging on the rear cavity.

TURNTABLE MOTOR

6. Disconnect the wire leads from the turntable motor.
7. Remove one (1) screw holding turntable motor to the oven cavity.
8. The turntable motor is now free.

HOOD LAMP SOCKET

9. Disconnect the wire leads from the lamp socket.
10. Remove the two lamp covers and remove the two (2) screws holding the lamp socket to the base plate. Remove the lamps. The lamp socket is now free.

Oven Lamp And Lamp Socket Removal

1. Disconnect the power supply cord, remove the hood exhaust louver.
2. Remove the two (2) screws holding the air protector R to the oven cavity front flange, then remove the air protector R.
3. Disconnect the wire leads from lamp socket.
4. Turn the lamp socket and release it from the air duct.
5. Turn the oven lamp out from the lamp socket.
6. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the small flat type screw driver. Lamp socket is now free.

Control Panel Assembly, Control Unit And Key Unit Removal

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Remove two (2) screws holding the hood exhaust louver to oven cavity front face plate.
5. Remove the hood exhaust louver from the oven by pushing the right and left tabs of the hood exhaust louver.
6. Remove one (1) screw holding the control panel to the oven cavity front face plate.
7. Release the control panel from the oven cavity front face plate by lifting it up.
8. Disconnect the wire leads from the relays RY1 and RY2.
9. Disconnect the connectors CN-A, CN-C and CN-E from the control unit.
10. Remove the control panel assembly from the oven.
11. Now, the control panel assembly is free.
12. Disconnect the connector CN-G from the control unit.
13. Remove two (2) screws holding the power unit to the key.
14. Release the two (2) tabs holding the power unit to the key fixing plate.
15. Release the three (3) tabs holding the LCD to the LCD holder.
16. Release the two (2) tabs holding the LSI unit to the LCD holder.
17. Remove the LCD holder and the LED sheet. Control unit is now free.
18. Remove the one (1) screw holding the key fixing plate to the control panel.
19. Release the six (6) tabs holding the key fixing plate to the control panel.
21. Remove the key fixing plate from the control panel.
22. Remove the key unit from the key fixing plate.
23. Now, the key unit is free

NOTE

NOTES FOR KEY UNIT REPLACEMENT

1. Do not reuse the torn key unit because the performance of the adhesive becomes weak.
2. Before attaching a new key unit, wipe off remaining adhesive on the control panel frame surfaces completely with a soft cloth soaked in alcohol.
3. When attaching key unit to control panel frame, adjust upper edge and right edge of the key unit to the correct position of control panel frame.
4. Place the key unit firmly to the control panel frame by rubbing with soft cloth not to scratch.

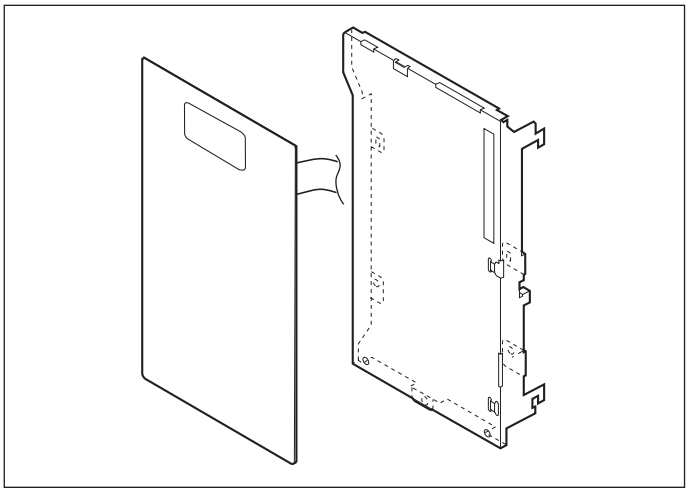


Figure 4-2. Key Unit Location

Door Sensing Switch, Primary Interlock Switch And Monitor Switch Removal

Removal

1. Disconnect the power supply cord, remove oven from wall, then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Remove the three (3) screws holding the hood intake duct R to the oven cavity top plate, the oven cavity front flange and the fan duct. And remove the hood intake duct R.
5. Remove the control panel assembly, referring to the procedure of "Control Panel Assembly , Control Unit And Key Unit Removal".
6. Remove the two (2) screws holding the latch hook to the oven cavity front flange.
7. Remove the latch hook from the oven cavity front flange.
8. Disconnect the wire leads of each switch.
9. Remove each switch from the latch hook by pushing the one (1) stopper tab holding each switch.
10. Now, each switch is free.

RE-INSTALL

1. Re-install each switch in its place. The primary interlock switch is in the lower position, door sensing switch is in the upper position and the monitor switch is in the middle position.
2. Re-connect wire leads to each switch. Refer to pictorial diagram.
3. Secure the latch hook (with two (2) mounting screws) to oven cavity front flange.
4. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit. Refer to Section 3.

Door Sensing Switch, Primary Interlock Switch, And Monitor Switch Adjustment

1. Disconnect the power supply cord and remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Remove the three (3) screws holding the hood intake duct R to the oven cavity top plate, the oven cavity front flange and the fan duct. And remove the hood intake duct R.
5. Remove the control panel assembly, referring to the procedure of "Control Panel Assembly, Control Unit And Key Unit Removal".

If door sensing switch, primary interlock switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

6. Loosen the two (2) screws holding latch hook to the oven cavity front flange.
7. With door closed, adjust latch hook by moving it back and forth, and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The vertical position of latch hook should be adjusted so that the door sensing switch and primary interlock switch are activated with the door closed. The horizontal position of the latch hook should be adjusted so that the monitor switch is activated with the door closed.
8. Secure the screws with washers firmly.
9. Check all of the switches operation. If any switch has not activated with the door closed, loosen screw and adjust the latch hook position.

After adjustment, check the following.

1. In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of latch hook, pushing and pulling lower portion of the door toward the oven face. Both results (play in the door) should be less than 0.5mm.
2. The door sensing switch, and secondary interlock switch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

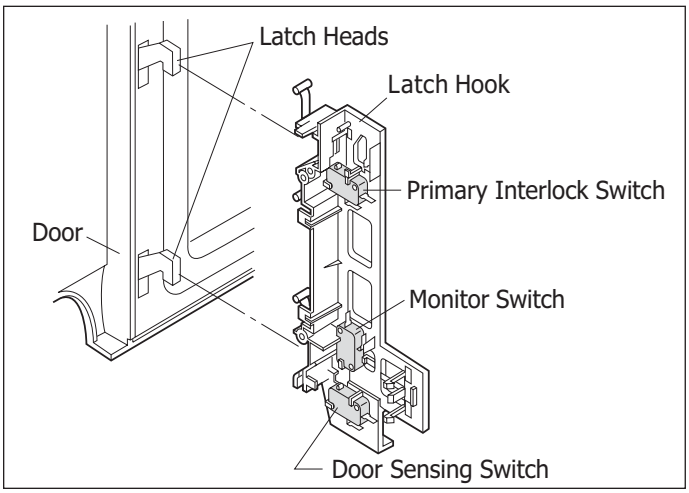


Figure 4-3. Latch Switch Adjustments

Door Replacement

REMOVAL

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. To discharge the high voltage capacitor.

NOTE

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Remove the three (3) screws holding the hood exhaust louver to the oven cavity front face plate.
5. Remove the hood exhaust louver from the oven cavity by pushing the right and left tabs of the hood exhaust louver. (Refer to the procedure of "Hood Exhaust Louver Removal".)
6. Insert a putty knife (thickness of about 0.5mm) into the gap A between the door stopper and the choke cover as shown in Figure 4-5 to free engaging parts.
7. Lift up the door stopper.
8. Now, the door stopper is free from the door assembly.
9. Lift up the door assembly to release the upper and lower door hinge pins from the upper and lower oven hinges. Door assembly is now free

NOTE

When the individual parts are replaced, refer to "Door Disassembly".

DOOR ASSEMBLY RE-INSTALL

1. On re-installing door, insert the lower oven hinge to lower door hinge pin.
2. Insert the upper oven hinge to upper door hinge pin.
3. Shut the door (close the contacts of interlock switches).
4. Make sure upper and lower oven hinges are inserted into the upper an lower door hinge pins.
5. Make sure the door is parallel with oven face lines (left and upper side lines) and door latch heads pass through latch holes correctly.
6. Re-install the door stopper to the door assembly.
7. Re-install the hood exhaust louver to the oven cavity front face plate with the three (3) screws.

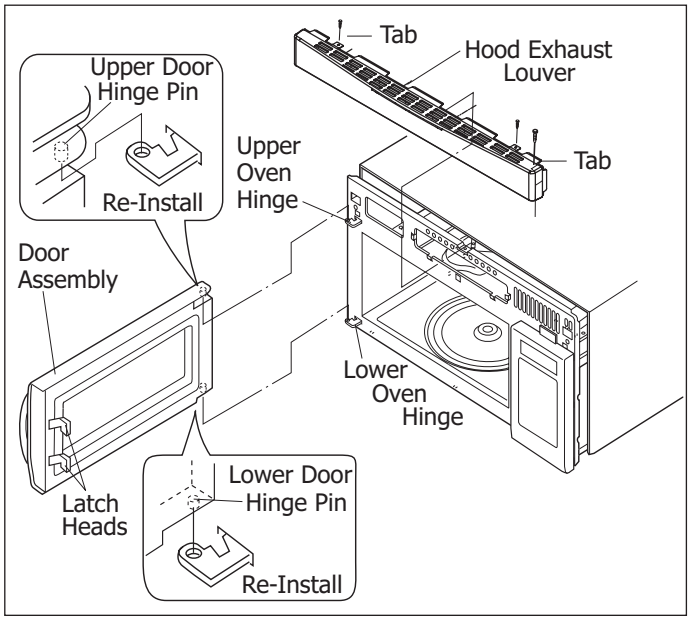


Figure 4-4. Door Components

NOTE

After any service to the door:

1. Make sure that door sensing switch and secondary interlock switch are operating properly. (Refer to section 3 "Test Procedures".).
2. An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

After any servicing, make sure of the following:

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through center of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

NOTE

The door on a microwave oven is designed to act as an electronic seal preventing leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and does not indicate a leakage of microwave energy from oven cavity.

Door Disassembly

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.
4. Remove the three (3) screws holding the hood exhaust louver to the oven cavity front face plate.
5. Remove the hood exhaust louver from the oven cavity by pushing the right and left tabs of the hood exhaust louver. (Refer to the procedure of "Hood Exhaust Louver Removal".)
6. Remove door assembly, referring to "Door Replacement".

Replacement of door components are as follows:

7. Place door assembly on a soft cloth with latches facing up.

NOTE

As the engaging part of choke cover and door frame are provided at 15 places, do not force any particular part.

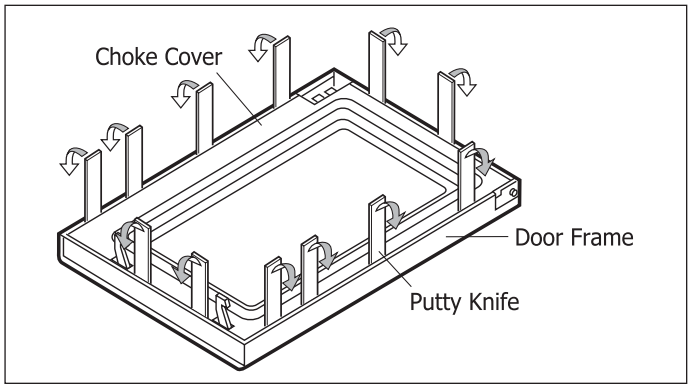


Figure 4-5. Door Components

CHOKE COVER

8. Insert a putty knife (thickness of about 0.5mm) into the gap A between the choke cover and door stopper and between the choke cover and the door frame as shown Figure 4-5 to free engaging parts.
9. Pry the choke cover by inserting a putty knife in order shown in Figure 4-5.
10. Now choke cover is free from door panel and door frame.

NOTE

When carrying out any repair to the door, do not bend or warp the slit choke (tabs on the door panel assembly) to prevent microwave leakage.

DOOR FRAME ASSEMBLY

11. Remove two (2) screws holding the door panel to the door frame assembly.
12. Release the door panel from the door frame assembly.

NOTE

It is easier to release the engaging parts of the upper or lower door hinge pin side at first.

13. Now, door frame assembly is free.

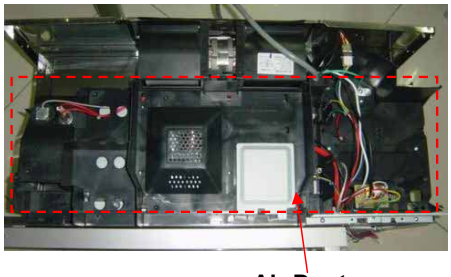
LATCH SPRING, LATCH HEAD AND DOOR PANEL

14. Release the latch spring from the tab of the latch head and tab of the door frame.
15. Release the latch head from the door frame.
16. Now, the latch spring and latch head are free.

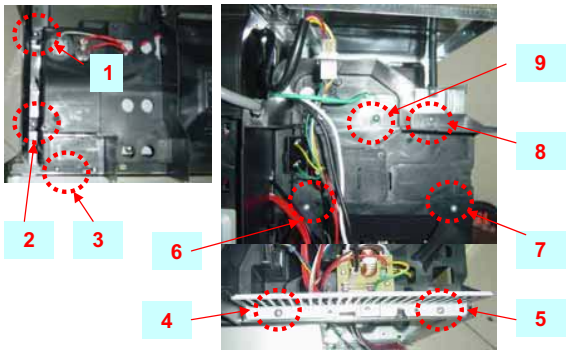
CONVECTION ASSEMBLY REPLACEMENT AND COMPONENT TEST PROCEDURE

1.Convection assembly replacement

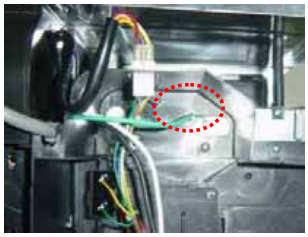
1) Remove the out case



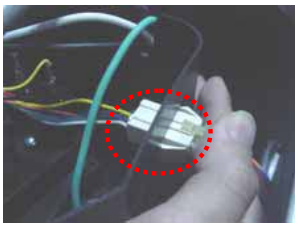
2) Remove the 9 screw s hol ding the Air Duct



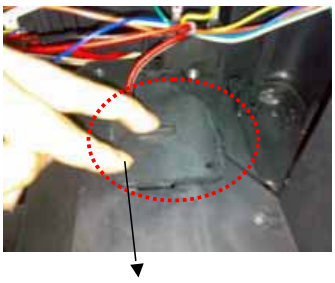
3) Remov e the 1 sc rew hol ding the ea rth wire of the Pow er Cord, Remove the 1 screw hol ding the earth w ire of the Noise Filter.



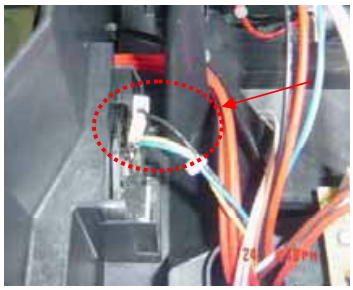
4) Remov e the 1 sc rew hol ding Vent Mot or, disconnect the wires connector of the Vent Motor, then re move the Vent Mot or.



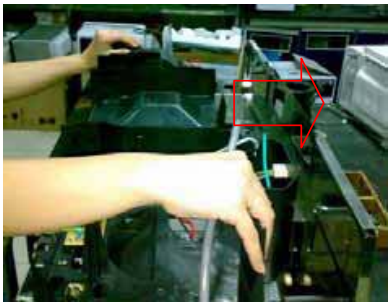
5) Remove the air cover above the Magnetron, disconnect the 2 wires of the Magnetron thermostat.



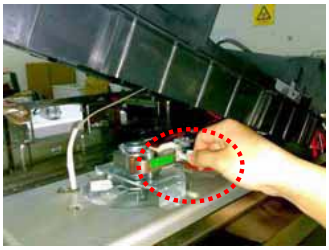
6) Disconnect the 2 w ires of the Lamp.

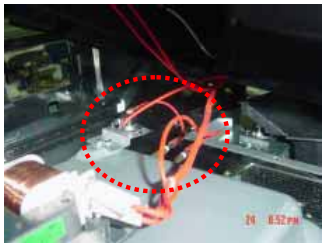


7) Backw ards move the Air Duct to release i t form the from plate of the cavity .

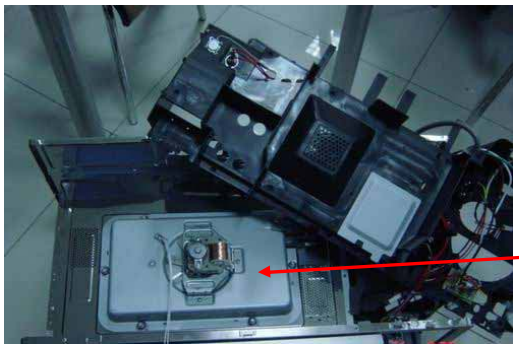


8) Open and handing t he Air Duct, disconnect the 2 w ires of the Conve ction Motor, disconnect the 2 w ires of the Convection Thermostat and discon nect the 2 w ires of the Heater.



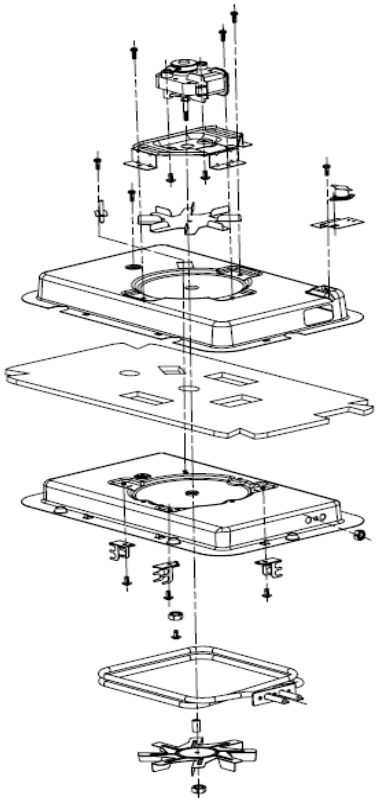


9) Move the Air Duct and hol d it on the Rear Plate of the cavity . Now, the Convection assembl y is available for service.

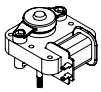


10) Remove the 6 screw nut ho lding the Convection Ass embly, Then remove the Convection Assembl y from the cavity .

11) Now, the Convection Motor, Convection Thermostat, temperature sensor and Heater are available for service.



2.Component test procedure

Convection **Motor** 	1. Remove wire leads. 2. Measure resistance. (ohm meter scale: Rx1)	Normal: Approximately: 30 to 40 ohms Abnormal: Infinite
Heater	1. Remove wire leads. 2. Measure resistance. (ohm meter scale: Rx1)	Normal: Approximately: 9 to 11 ohms Abnormal: Infinite

Printed Wiring Board

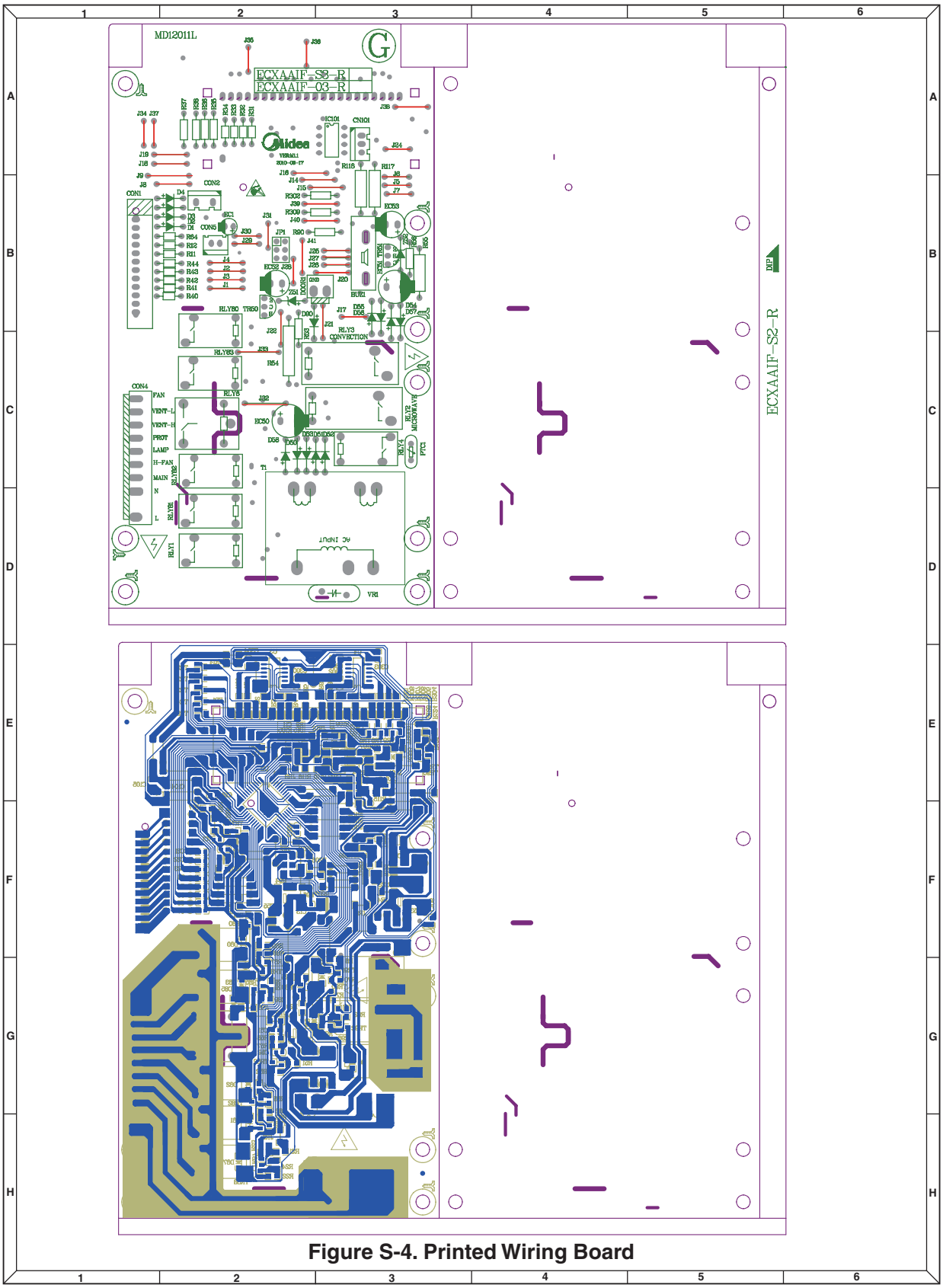
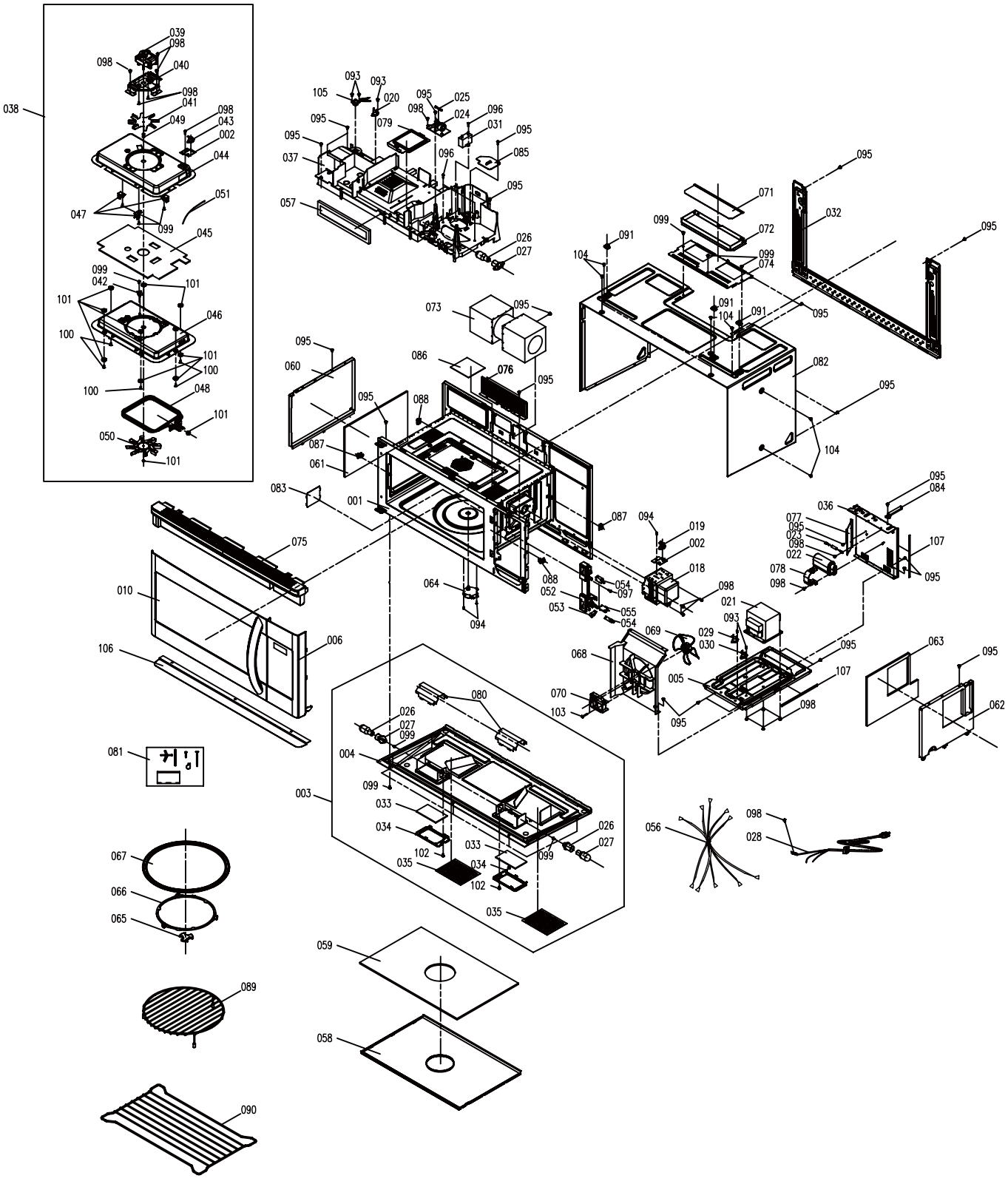
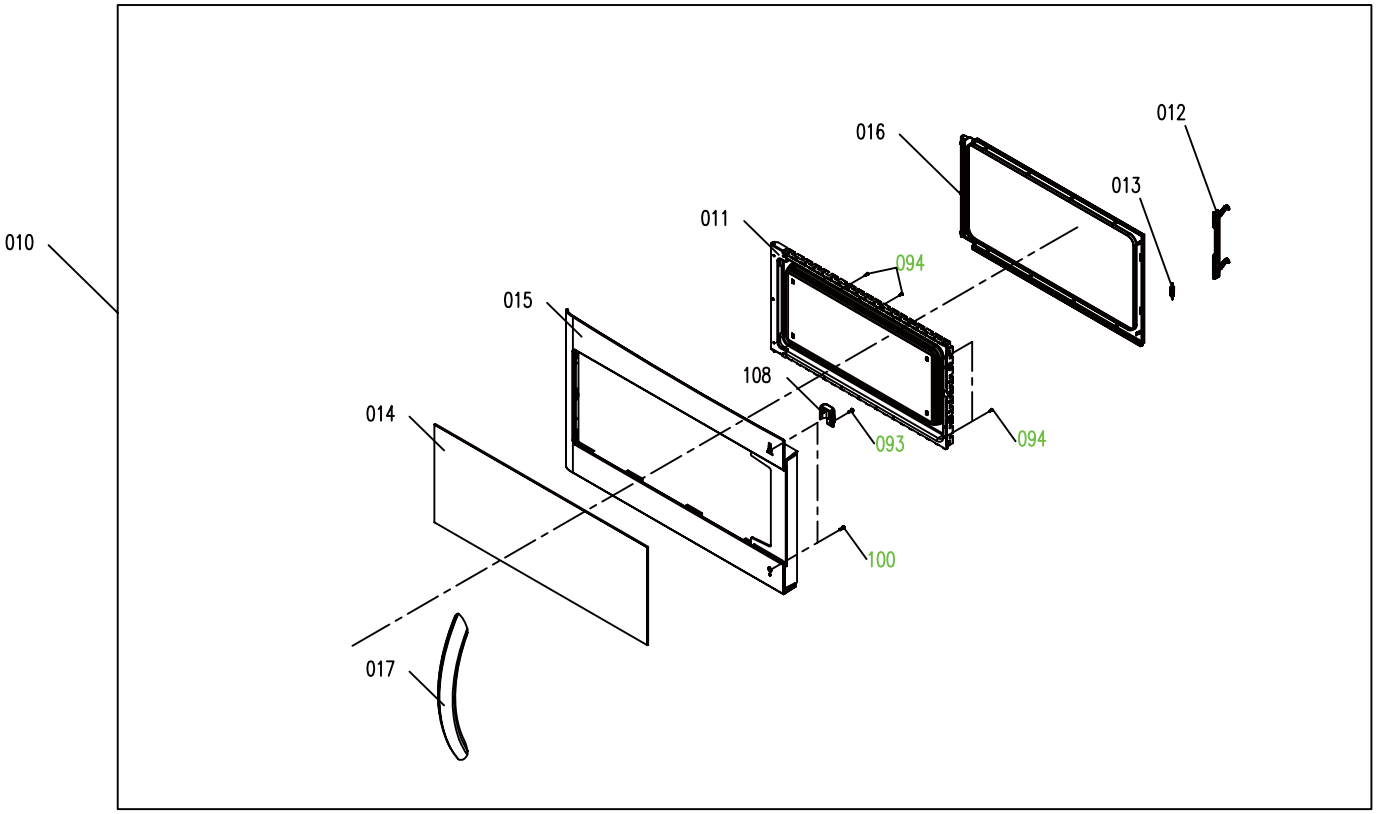


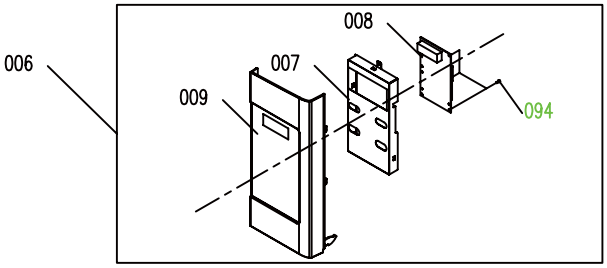
Figure S-4. Printed Wiring Board

Control Panel And Door Parts



Oven And Cabinet Parts





PARTS LIST

No	Part Name	PART NUMBER			Quantity
		FGMV154CLF(Stainless)	FGMV153CLB(Black)	FGMV153CLW(White)	
001	ASS'Y Cavity	251500100773	<<==	<<==	1
002	BRKT Thermostat	251502901931	<<==	<<==	1
003	ASS'Y Base Plate	263601100026	<<==	<<==	1
004	Base Plate	261501411002	<<==	<<==	1
005	Bottom Plate	251514100987	<<==	<<==	1
006	ASS'Y Controller	263600300832	263600300833	263600300834	1
007	Bracket Controller	251515901306	<<==	<<==	1
008	PCB ASS'Y	261400122400	<<==	<<==	1
009	ASS'Y Control Panel	263652600066	263652600067	263652600068	1
010	ASS'Y Door	263600202196	263600202197	263600202198	1
011	ASS'Y Door Frame	253602102007	<<==	253602102008	1
012	Latch	261300500601	<<==	<<==	1
013	Spring Latch	252010000302	<<==	<<==	1
014	Door Glass	262100401632	262100401632	262100401867	1
015	Door Panel	263600202195	263602100622	263602100623	1
016	Gasket Door	251300600082	<<==	<<==	1

017	ASS'Y Door Handle	261509407000	261300711700	261300711701	1
018	Magnetron	251200100024	<<==	<<==	1
019	Thermostat Magnetron	251201300916	<<==	<<==	1
020	Thermostat Cavity	251201300916	<<==	<<==	1
021	High Voltage Transformer	251200200251	<<==	<<==	1
022	High Voltage Capacitor	251200701302	<<==	<<==	1
023	High Voltage Diode	251200900954	<<==	<<==	1
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025	Fuse	256201200605	<<==	<<==	1
026	Lamp	251201500997	<<==	<<==	1
027	Socket Lamp	251201400600	<<==	<<==	1
028	Power Cord ASS'Y	251201000231	<<==	<<==	1
029	Thermostat H.V.T	251201300913	<<==	<<==	1
030	Thermostat Vent Motor	251201300584	<<==	<<==	1
031	Capacitor Starting	251204300998	<<==	<<==	1
032	Plate Mounting	251514200752	<<==	<<==	1
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034	Bracket Lamp Glass	261517400300	<<==	<<==	1
035	Filter Oil	262201300002	<<==	<<==	1
036	Guide Air	261503200100	<<==	<<==	1
037	Air Duct	251302203849	<<==	<<==	1
038	ASS'Y CONVECTION	263602400010	<<==	<<==	1
039	Motor Convection	251200600113	<<==	<<==	1
040	Motor Convection Bracket	251510801151	<<==	<<==	1
041	FAN COOLING	251508201152	<<==	<<==	1
042	SENSOR TEMPERATURE	256401001151	<<==	<<==	1
043	Thermostat 160/95 *H	251201300009	<<==	<<==	1
044	INSULATOR HEAT *T	251503502520	<<==	<<==	1
045	FIBER GLASS *T	252100600973	<<==	<<==	1
046	COVER HEATER *T	251500902525	<<==	<<==	1
047	SUPPORTER HEATER *T	251516800737	<<==	<<==	3
048	HEATER SHEATH *T	261201700470	<<==	<<==	1
049	SLEEVE MOTOR AXLE	251511000742	<<==	<<==	1
050	FAN CONVECTION	251508200638	<<==	<<==	1

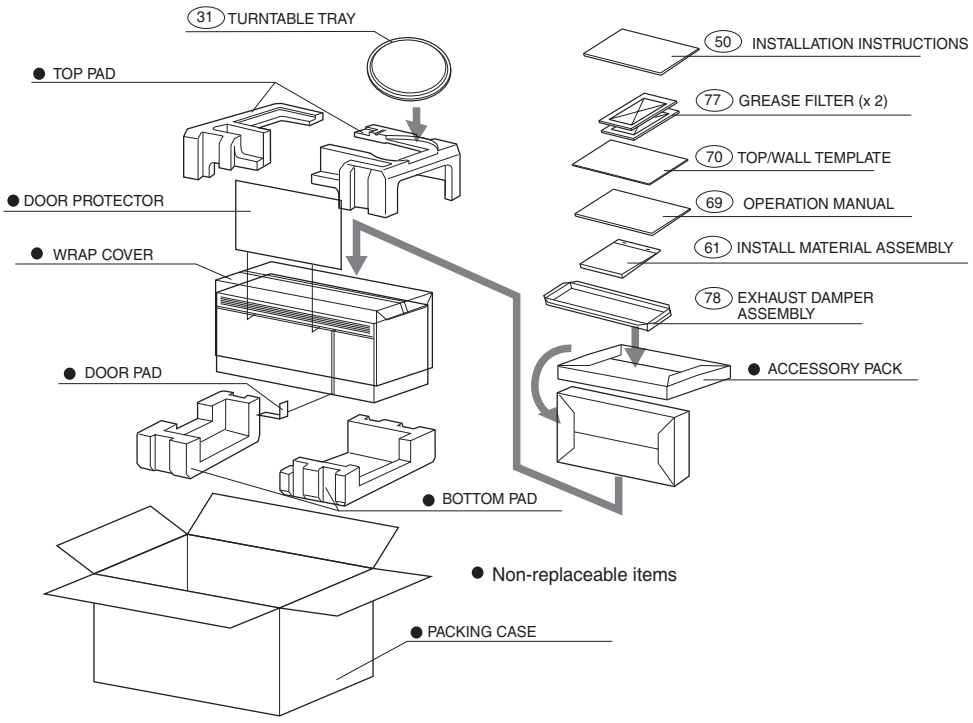
051	WIRE HEATER_THERMOSTAT	251202701535	<<==	<<==	1
052	Board Latch	251301302560	<<==	<<==	1
053	Lever Switch	251301100075	<<==	<<==	1
054	Microswitch Interlock	251201600929	<<==	<<==	1
055	Microswitch Monitor	251201600930	<<==	<<==	1
056	Harness Main	251202800772	<<==	<<==	1
057	Charcoal Filter	251515801044	<<==	<<==	1
058	INSULATOR HEAT *U	251505502524	<<==	<<==	1
059	FIBER GLASS *U	252100600974	<<==	<<==	1
058+059	INSULATOR Ass'y *U	263604000004	<<==	<<==	1
060	INSULATOR HEAT *L	251503502528	<<==	<<==	1
061	FIBER GLASS *L	252100600972	<<==	<<==	1
060+061	INSULATOR Ass'y *L	263604000006	<<==	<<==	1
062	INSULATOR HEAT *R	251503502530	<<==	<<==	1
063	FIBER GLASS *R	252100600971	<<==	<<==	1
062+063	INSULATOR Ass'y *R	263604000005	<<==	<<==	1
064	Motor Tray	251200300676	<<==	<<==	1

065	Coupler	262200100001	<<==	<<==	1
066	Ring Rotating ASS'Y	252200200012	<<==	<<==	1
067	Tray	252100500011	<<==	<<==	1
068	Guide Fan	261300800600	<<==	<<==	1
069	Fan	251300900015	<<==	<<==	1
070	Motor Fan	251200600100	<<==	<<==	1
071	Damper	251503400002	<<==	<<==	1
072	Bracket Damper	251515200000	<<==	<<==	1
073	Motor Vent	251204200820	<<==	<<==	1
074	Cover Vent Motor	261517600100	<<==	<<==	1
075	Grille Vent	263650301552	261310800700	261310800701	1
076	Protector Air-Right	251517500998	<<==	<<==	1
077	Guide Air Magnetron	251503402553	<<==	<<==	1
078	Holder H.V.C	251501500010	<<==	<<==	1
079	Cover Cavity Lamp	251514600993	<<==	<<==	1
080	Cover Lamp	251514400997	<<==	<<==	1
081	ASS'Y Kit	251515500710	<<==	<<==	1

082	Case Out	261502607200	<<==	261502607102	1
083	Cover Wave Guide	252100100573	<<==	<<==	1
084	Spacer	261302500100	<<==	<<==	1
085	WIND PREVENTER	261302200400	<<==	<<==	1
086	Glass Cavity Lamp	252101700975	<<==	<<==	1
087	Shelf Holder A	252202300000	<<==	<<==	1
088	Shelf Holder B	252202300001	<<==	<<==	1
089	Rack	261511709200	<<==	<<==	1
090	Shelf	251515402372	<<==	<<==	1
091	ASS'Y Mounting Nut	252012700360	<<==	<<==	1
092	ASS'Y Screw	263601000012	<<==	263601000015	1
093	Screw Φ3*8	257012800021	<<==	<<==	3
094	Screw Φ4*8	257012800001	<<==	<<==	5
095	Screw ST4*10TBHC	257012800032	<<==	<<==	35
096	Screw Φ4*12 PwBHC	257012800027	<<==	<<==	3
097	Screw Φ4*12 E	257012800074	<<==	<<==	2
098	Screw Φ4*8	257012800003	<<==	<<==	10

099	SCREW ST4*10TB	252012800101	<<==	<<==	10
100	SCREW ST4*10	252012800043	<<==	<<==	6
101	NUT M4	257012700002	<<==	<<==	14
102	Screw Φ4*6 K	252012800072	<<==	<<==	2
103	SCREW Φ4*25	257012800016	<<==	<<==	2
104	ST4*12PBHZn Black	252012800362	<<==	252012800101	7
105	SENSOR HUMIDITY	263004100003	<<==	<<==	1
106	Base Plate Supporter	261519100100	<<==	<<==	1
108	Veneer Door	261302304000	261302304000	261302304001	1

PACKING AND ACCESSORIES



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